# COMMODORE user

INCORPORATING VIC COMPUTING

FEBRUARY 1985 PRICE 95p



## COMPUTER BLIND?

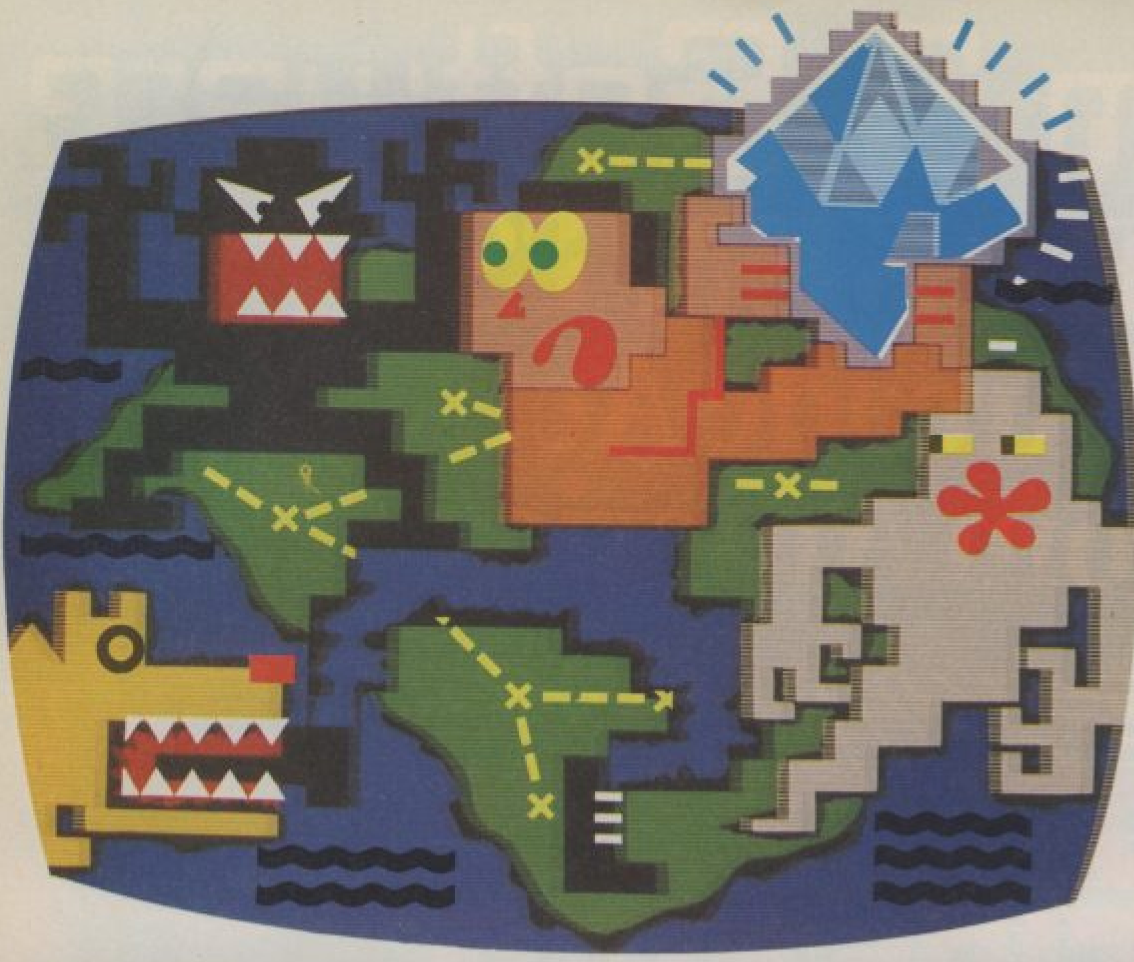
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The Spirit of the Stones book is a great read.

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A fascinating tale of mystery and imagination.

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You can't choose better.

Commodore software: it costs no more, even though there's more to it.

**SPIRIT OF THE STONES DISK OR CASSETTE WITH BOOK £14.99.**



# Contents


**News** 8
We're first with the latest news from the world of the Commodore

**The Happy Hacker** 19
We begin a regular series by the hacker's hack, Robert Schifreen, that'll keep you in touch with Compunet and Micronet.

**Business User** 26
In this month's business section, Karl Dallas investigates an application for the 64 in your chemist, and brings us some up-to-date news.

**Victuals** 28
Among this month's batch of programs is our first ever for the Commodore 16. There's also an epidemic on the 64 and some useful routines.

**Operation Salvage** 44
A corrupted or NEWed program can be bad for the blood pressure — Frank Randall tells you how to recover your cool.

**Plugging into Epson** 47
Chris Durham reviews the Comprint interface which makes an Epson printer compatible with your 64.

**Beginners Basic** 54
The first of a four-part series by Brian Grainger designed to lead you gently into the world of Basic programming.

**The Forth Dimension** 56
This month Richard Hunt gets to grips with the knotty problems of string handling and keyboard input.

**Competition** 59
Answer three ridiculously simple questions and win Activision's Designer's Pencil.

**From Paintpots to Pixels** 60
The graphics capabilities of the 64 are impressive, but to get the best of them you'll need to use some graphics software. We help you sort through the possibilities.

**Man at the Top** 70
Bohdan Buciak went to Corby to find out from Commodore's general manager, Howard Stanworth, how the company was doing and what he had in mind for the future.

**Making the Grade** 76
If you break out into a cold sweat at the thought of the dreaded 'O' Level exams, help is at hand with some revision programs. Colleen Young adjudicates.

**Tommy's Tips** 85
Tommy emerges once again with more answers to those everyday problems . . .











## People


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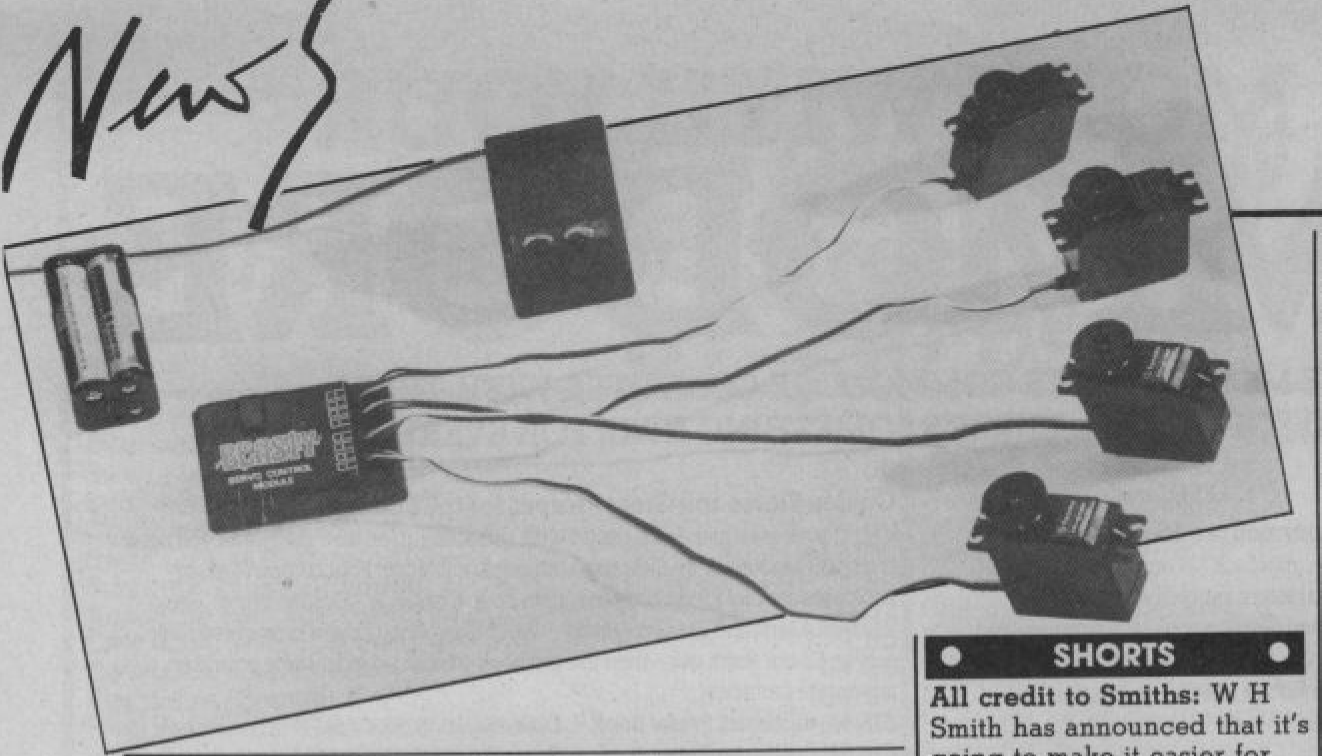
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# News



## Commodore Beasties

Robotics fans will be pleased to read that an infra red version of the Beasty control unit (previously available only for the BBC micro) is now available for the Commodore 64. It will allow you to control the Beasty Robotic Arm.

The device is an eight channel interface which its distributors, Commotion, claim to be fully compatible with both the Beasty arm and its mobile base. It can control that, or up to eight servo motors within a minimum range of six metres.

Commotion hasn't fixed prices for the infra red Beasty yet, but say it will be under £50. It also supplies servo motors from Futaba at £14.50 each for the standard model. The Beasty arm itself comes in two forms: £110 for a ready-assembled package with three servos, or £39.95 for the DIY kit. More details from Commotion on 01-804 1378.

### • SHORTS •

**All credit to Smiths:** W H Smith has announced that it's going to make it easier for you to splash out on computers, peripherals and software. Its computer shops and departments are now offering credit on purchases between £400 and £2,000, ten percent of which is taken as an initial deposit. You pay back in monthly installments over one, two or three years. Maybe now you'll be able to buy that disk drive, and printer, and monitor and . . .

### • SHORTS •

**Breakaway:** yet another episode in the great software house musical-chairs game. Mark Meakings, co-founder of Bubble Bus has left to set up a new company, Lionheart. Apparently, Meakings decided it was time to break away and start afresh. And what are Lionheart's aims? To produce "innovative" and "high quality" software. But that may depend on you — Lionheart is looking for talented freelance programmers.

### • SHORTS •

**Radio news:** amateur radio buffs will be pleased to hear that Moray Micro Computing has announced a QTH Locator program for the 64 (£6.50 on tape, £8.50 on disk). The program calculates the distance between QTH Locator squares, a new QTH Locator square between two points whose longtitude and latitude is specified, and calculates the new six-digit QTH Locator square from the previous five-digit QRA locator. What's a QTH Locator? Better ask a Radio Ham. Moray is on 05427 384.

## Fact-packed software

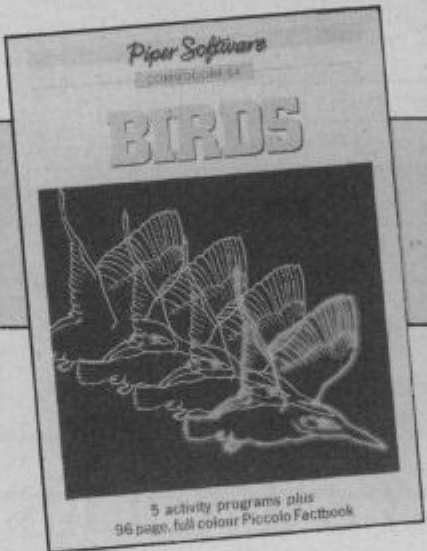
Piper Software, a subsidiary of Pan Books, has introduced a range of software for the Commodore 64 that "brings information to life as never before", according to the blurb. The subjects being given this enlivening treatment are birds, aeroplanes, dinosaurs and astronomy.

There's a Software Activity Pack for each of these subjects, designed for children aged eight or over, which includes a cassette containing four educational games, and an accompanying 96-page fact book on the particular subject (after all, Pan are book publishers). Each package in the range costs a mere £7.95.

For those of you interested in aeroplanes, the Aircraft program gives you four games: a flight simulator (you get an unusual sideways view of the plane), a program to test your skills at taxiing, an enemy fighter identification program and a shoot 'em up game (you estimate range, height and bearing).

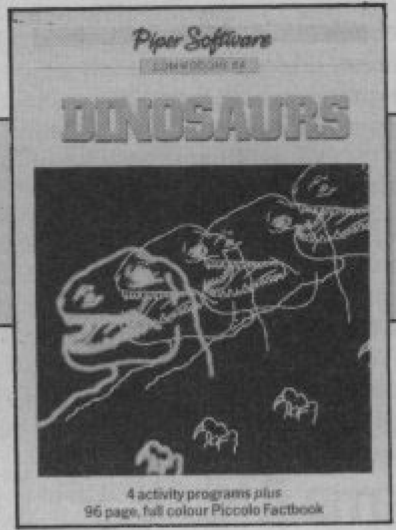
As well as the accompanying book, the Astronomy package has five games on its cassette: pilot your spaceship to discover hidden planets, answer questions to progress from Trainee to Ace Astronaut, build a databank to hold your planet information. More interestingly, there's a program to introduce you to the Constellations and a Zodiac Star Map that shows you how the constellations link together.

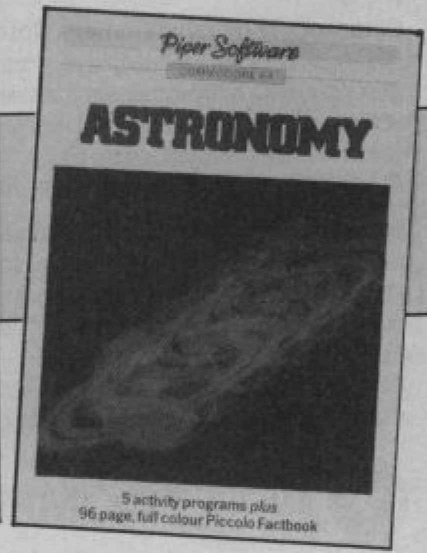
The Birds package also gives you five games, ranging from steering a winter migrating bird back to sunny Britain, to building a database in which to collect your bird facts. Finally, there's Dinosaurs, which follows roughly the same type of format, though one of the games sets out to let you control the evolutionary process — amazing what you can do with a 64.









**ONLY £34·95**
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## THE ROTRONICS DR2301 COMPUTER/ AUDIO CASSETTE RECORDER

The Rotronics DR2301 has all the facilities you would expect of a quality audio recorder and also works perfectly with the VIC 20 and CBM 64 computers without any fiddly separate boxes or adaptors. Simply connect the DR2301 directly with your Commodore computer via the lead supplied and you are ready to start. The built-in interface circuitry ensures that SAVEing and LOADing is completely reliable – even when using commercially produced software. The DR2301 also allows the computer to sense when the PLAY key has been depressed.

Additional features are auto-stop, tape counter, in-built microphone and foldaway carrying handle. The DR2301 is also compatible with the ZX81, Spectrum and many other popular home computers.

The DR2301 will take its power from the computer (Commodore only), mains adaptor (supplied) or internal batteries. Each unit carries a full 12 month guarantee.

# Superb accessories for Commodore from Rotronics

## THE ROTRONICS PORTABLE CASE

Here is the ideal portable work station for home, school or work. Specially made for most home microcomputers, it contains your VIC 20 or CBM 64 within a smart executive style case with removable lid for convenience in use.

The individually tailored foam insert securely protects your micro and cassette recorder (C2N or DR2301) during transit. Additional storage space in the lid holds manuals and up to twenty cassettes. A scalpel is provided to modify the insert for expansion units and an alternative insert can be supplied if you change your hardware in the future. The case is also available with uncut foam inserts.

All components remain fully operational within the case via inter-connections routed between the double layers of foam, so there are no unsightly leads.

The case has been designed for easy use with each component positioned for convenient operation. The overall dimensions are 138mm x 725mm x 363mm.

**ONLY £34·49 (p+p £2·50)**





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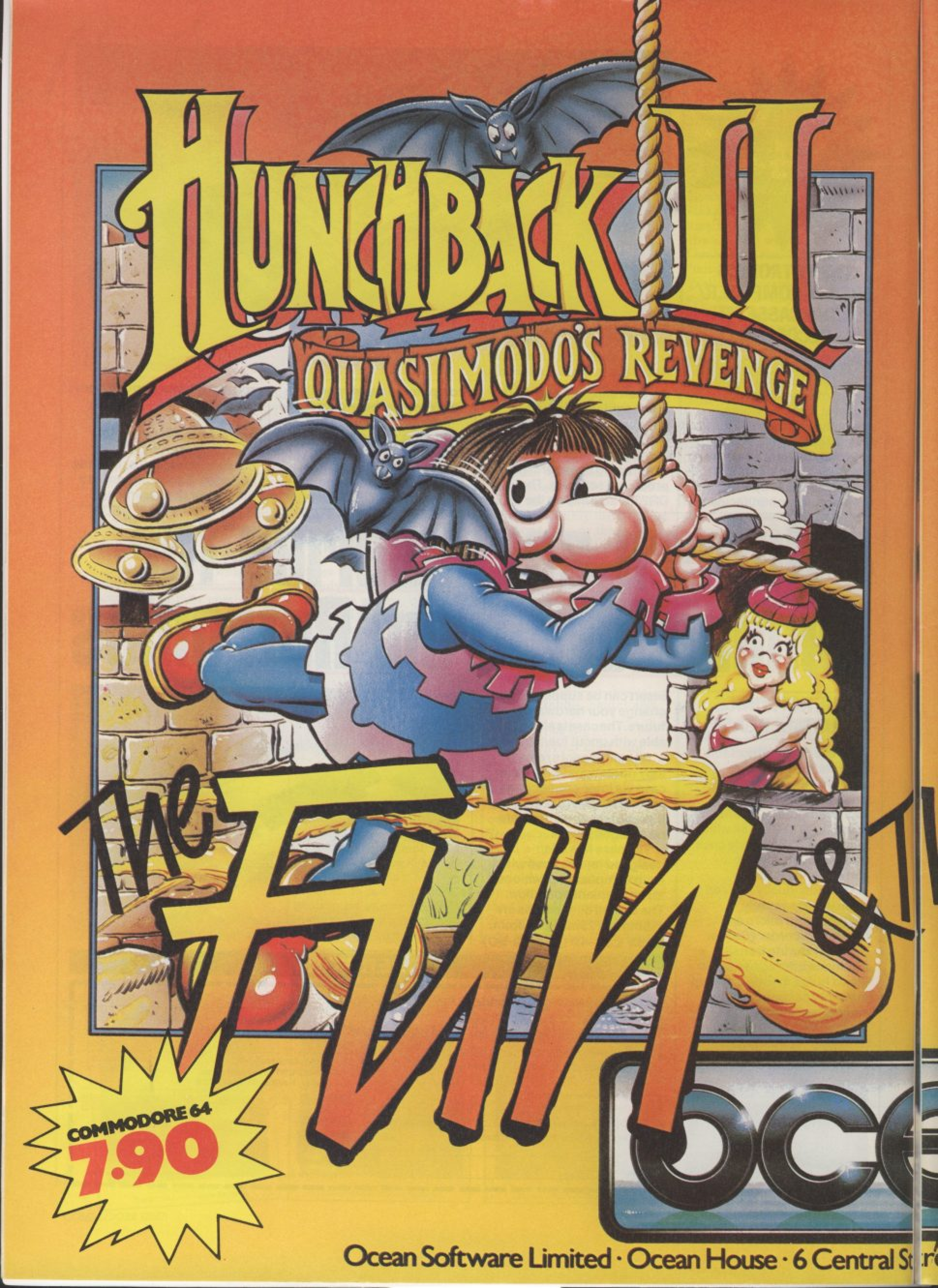
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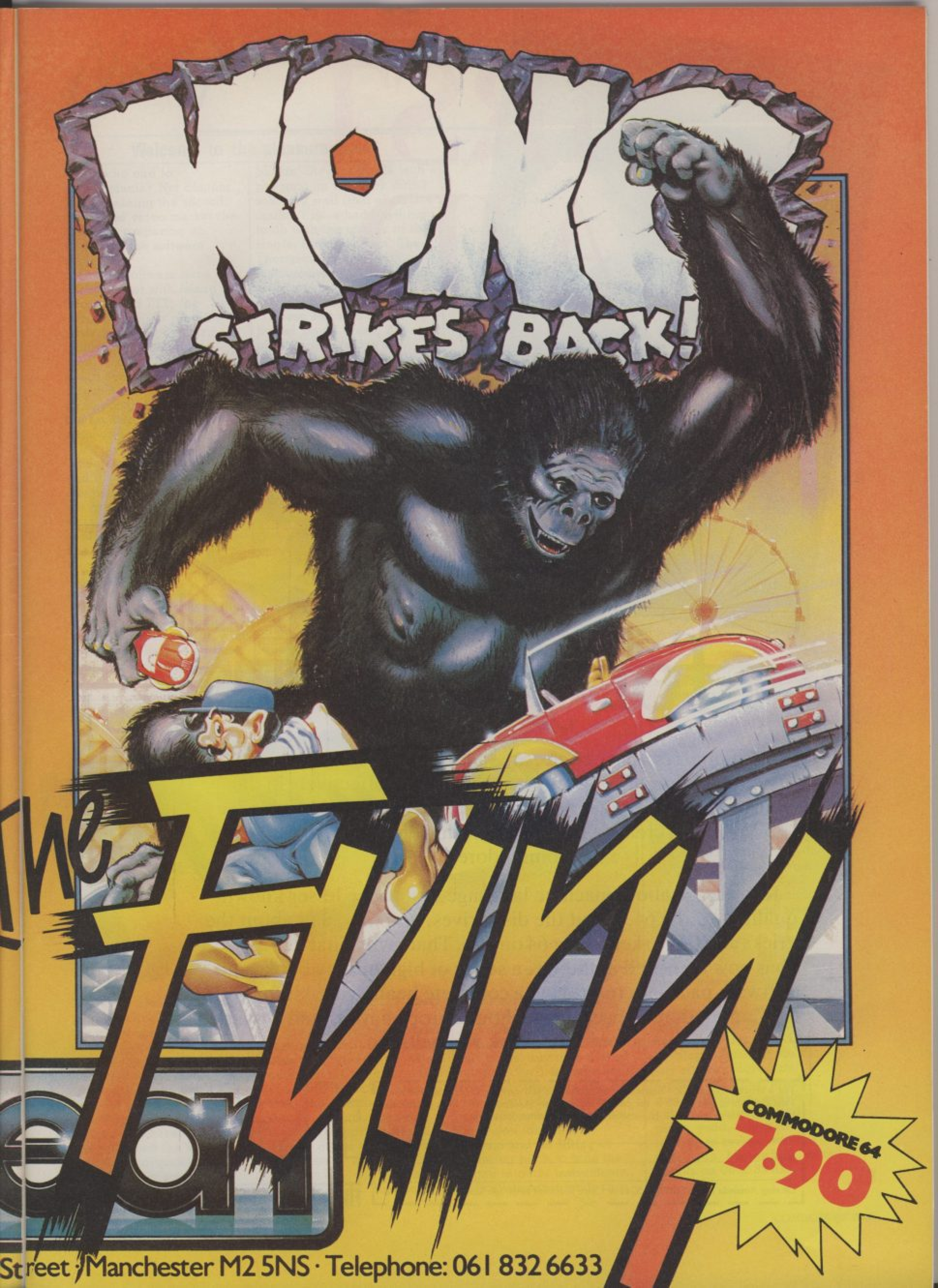
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Computers, like people, are fallible. They need the right combination of code and care to perform effectively in the business or the home. And that requires first hand knowledge from you to create a healthy operating environment for your Commodore 64.

Knowledge about machine language, about the lesser known qualities of the 64, about the disc drives, graphics, and about the tricks and tips to keep your 64 on line. That's why First Publishing has now launched in the UK a series of high quality books and software packages to provide a complete health care kit for your 64. Commodore 64 users throughout Europe have already found it a tonic. We think you will, too.

For a brochure on all the Commodore 64 books and software packages available from First Publishing, please fill in the coupon and send to: Amanda York, First Publishing, Unit 20B, Horseshoe Road, Horseshoe Park, Pangbourne, Berkshire.

Name ____________________

Address ____________________

____________________

Or ring *Amanda York* at (07357) 5244 or Calco Software at 01-546 7256 CU/2

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# News

## Welcome to the pleasuregame

Is there no end to Frankiemania? Not content with cornering the record, t-shirt and video market the band are preparing an assault on the software world.

Ocean Software have joined forces with Island Records and ZTT, the group's label, to produce an advanced computer game featuring the naughty scallies. It will run on both the Spectrum and the Commodore 64, with the three companies receiving the revenue and the band receiving royalties.

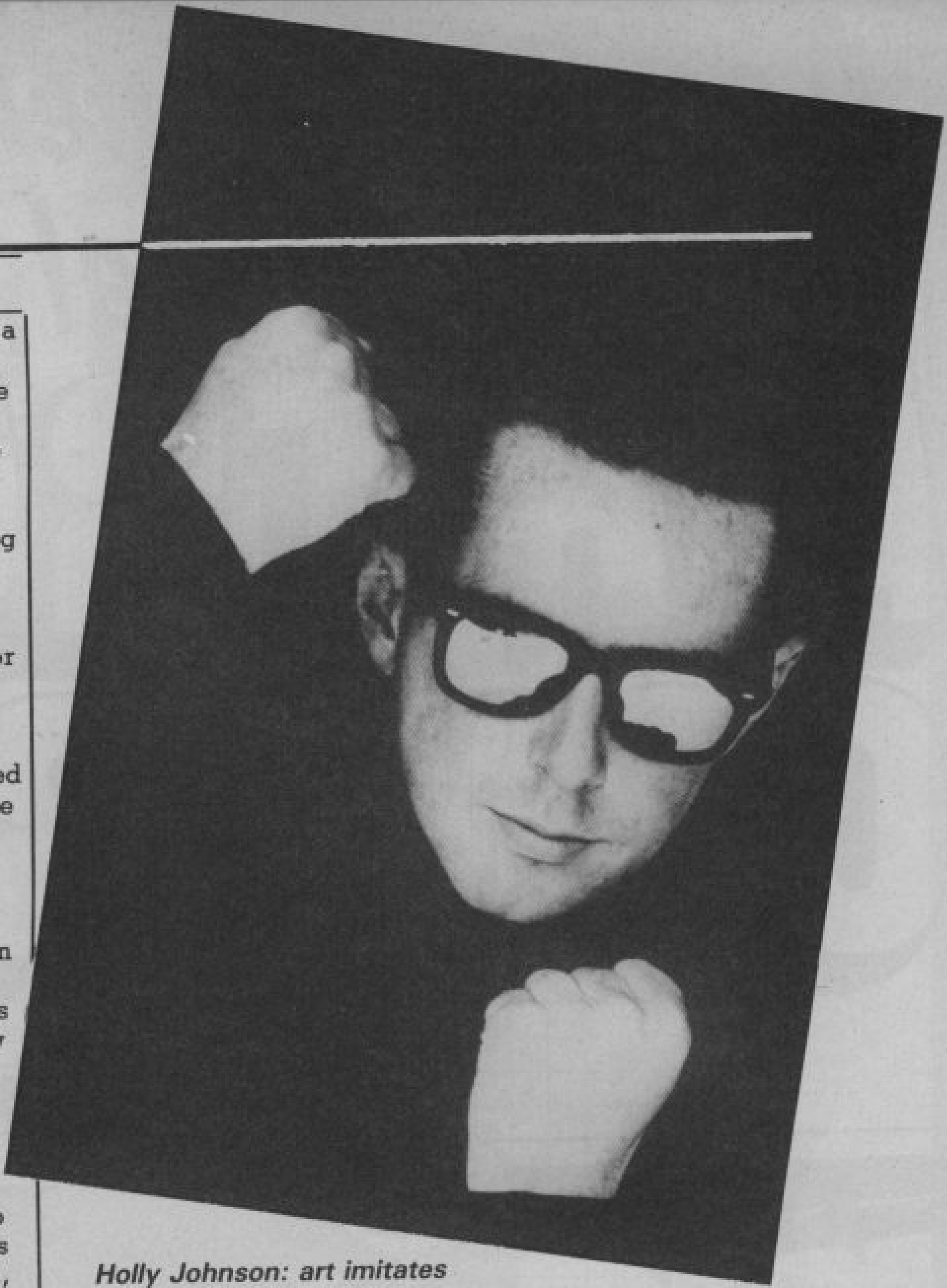
It's described as a "spectacular" in the blurb and it will follow an adventure format involving the group in various situations, though, we're assured, "it won't be dirty". Shame. The story has yet to be written but it seems that Paul Morley, ZTT impressario, will be responsible for much of the *creative* input. Laughter.

Games which link up with pop groups haven't all been entirely successful. A Shakin' Stevens single with a program on the back didn't sell very well (that of course couldn't have had anything to do with the quality of the single, though). Also, The Thompson Twins' management pulled the plug on a computer game involving the band.

These setbacks don't bother David Ward, director of Ocean. "Frankie are simply a hook to hang the game on. The game has to be good — often titles linked with stars won't sell because they rely on the name.

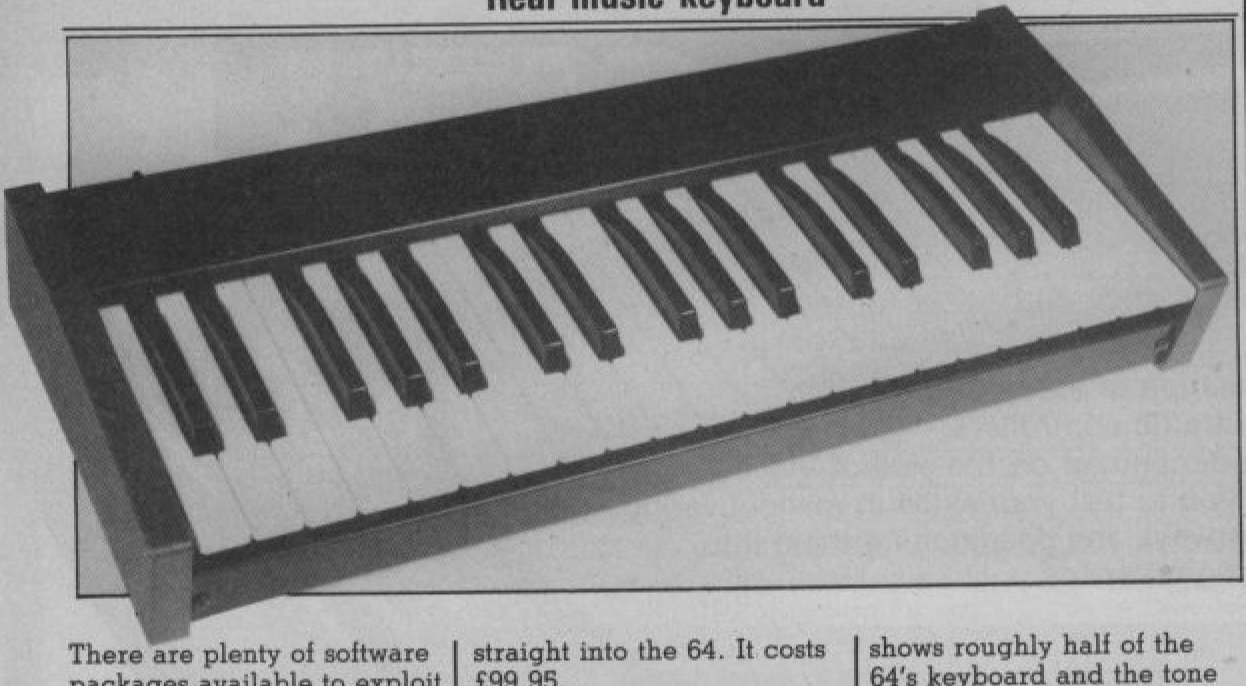
"The Frankie game will work because it can be played on different levels, like the various meanings in a book. There is a concept behind the band that makes them very interesting. They are life imitating art."

Sounds to us as if he's fallen for the ZTT hype, either that or he's been reading Paul Morley's old *NME* articles. We'll have to wait for the result of all this philosophy until the spring, when it will sell for £9.95.



*Holly Johnson: art imitates life imitates software game*

## Real music keyboard



There are plenty of software packages available to exploit the music making potential of your Commodore 64, but most of them use the 64's keyboard as a music keyboard — and that's a bore for budding Stevie Wonders. Now, LVL, a Nottingham-based company has produced the Echo 1 keyboard complete with Organ Master software (on cassette or disk), that plugs straight into the 64. It costs £99.95.

The three-octave keyboard is sturdily built with full-size keys. It plugs into the 64's user port via a ribbon cable and adaptor socket, and needs no external power supply. Its accompanying software comprises two modes: organ and synthesiser.

When run, the program is in organ mode. Your screen shows roughly half of the 64's keyboard and the tone and effects tabs associated with each computer key. In this mode, any note played on the Echo 1 is immediately sounded. Two keys also let you select one-finger major and minor chords. There's provision for tremolo, vibrato and for lifting or lowering pitch to tune the organ to other instruments.

In synthesiser mode the screen display changes to give details of SID chip parameters like the ADSR envelope. Pressing the F1 key allows progression through triangles, synchro, ring modulation, sawtooth, pulse and noise. Sounds pretty good, and we're looking to review it in the next issue. Meanwhile, more details on 0602 394000.

### SHORTS

**Adventure on disk:** Level 9 has announced that all six of its adventures for the Commodore 64 are now available on disk, at £9.95 each. For those of you who've already bought cassettes, the company will exchange them. Just send the cassette to Level 9 with £2.50 to cover cost, and a disk should wing its way to you. Oh, and you can get one of the company's A3 colour posters by sending them a stamped-addressed envelope. Level 9's address is: 229 Hughenden Road, High Wycombe, Bucks HP13 5PG.


Another winner in the range of Sensational Software....
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This is not just a game but a simulation of everyday problems encountered by those real-life air traffic controllers.
All air travellers are unconciously dependant on the skill of these people and this program enables you to test your skills in manoeuvering aircraft safely around the air motorways and despatching them into the hands of others in neighbouring air space.
Home Computer Weekly
It is fascinating to watch, and interesting to play.
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As absorbing as a flight simulator, but different!
instructions 95%
playability 100%
graphics 95%
value for money 90%
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COMMODORE user

# SOFTWARE TOP 30

| THIS WEEK | LAST WEEK | WEEKS IN CHART | TITLE | Publisher | Computer | SPECTRUM | VIC 20 | COMMODORE 64 | ELECTRON | ATARI | DRAGON | ORIC | BBC | OTHER |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | (Available on) | | | | | | | | |
| 1 | 2 | 2 | **Ghostbusters** | Activision | Com 64 | | | ★ | | | | | | |
| 2 | 1 | 8 | **Daley Thompson's Decathlon** | Ocean | Spec | ★ | | ★ | | | | | | |
| 3 | — | 1 | **Starstrike** | Real Time | Spec | ★ | | | | | | | | |
| 4 | — | 1 | **Elite** | Acorn | Electron | | | | ★ | | | | ★ | |
| 5 | — | 1 | **Raid Over Moscow** | U.S. Gold/Access | Com 64 | | | ★ | | | | | | |
| 6 | — | 1 | **Pyjamarama** | Micro Gen | Spec | ★ | | | | | | | | |
| 7 | 4 | 6 | **Elite** | Acorn | BBC | | | | ★ | | | | ★ | |
| 8 | — | 1 | **Match Play** | Ocean | Spec | ★ | | | | | | | | |
| 9 | — | 1 | **Booty** | Firebird | Spec | ★ | | ★ | | | | | | |
| 10 | 14 | 2 | **Skool Daze** | Micro Sphere | Spec | ★ | | | | | | | | |
| 11 | 5 | 9 | **Daley Thompson's Decathlon** | Ocean | Com 64 | ★ | | ★ | | | | | | |
| 12 | — | 1 | **Hunchback II** | Ocean | Spec | ★ | | | | | | | | |
| 13 | 9 | 6 | **Chiller** | Master Tronic | Com 64 | | | ★ | | | | | | |
| 14 | 3 | 3 | **Knight Lore** | Ultimate | Spec | ★ | | | | | | | | |
| 15 | 11 | 3 | **Select One** | Computer Records | Com 64 | ★ | | ★ | | | | | | |
| 16 | 8 | 14 | **Beach Head** | Access/U.S. Gold | Com 64 | ★ | | ★ | | | | | | |
| 17 | — | 1 | **Combat Lynx** | New Gen. | Com 64 | ★ | | ★ | | | | | | |
| 18 | 17 | 2 | **Select One** | Computer Records | Spec | ★ | | ★ | | | | | | |
| 19 | — | 1 | **Air Wolf** | Elite | Spec | ★ | | | | | | | | |
| 20 | 15 | 6 | **Beach Head** | Access/U.S. Gold | Spec | ★ | | ★ | | | | | | |
| 21 | — | 1 | **Perils of Willy** | Software Projects | Vic 20 | | ★ | | | | | | | |
| 22 | 10 | 2 | **Cyclone** | Vortex | Spec | ★ | | | | | | | | |
| 23 | 20 | 4 | **BMX Racers** | Master Tronic | Spec | ★ | | ★ | | | | | | |
| 24 | — | 1 | **Scramble 64** | Interceptor | Com 64 | | | ★ | | | | | | |
| 25 | — | 1 | **Booty** | Firebird | Com 64 | ★ | | ★ | | | | | | |
| 26 | 28 | 2 | **Doom's Dark Revenge** | Beyond | Spec | ★ | | | | | | | | |
| 27 | — | 1 | **Jet Set Willy** | Software Projects | Com 64 | ★ | | ★ | | | | | | |
| 28 | 12 | 3 | **Underwurlde** | Ultimate | Spec | ★ | | | | | | | | |
| 29 | 23 | 4 | **Combat Lynx** | Durrell | Spec | ★ | | | | | | | | |
| 30 | 26 | 2 | **Jet Set Willy** | Software Projects | Spec | ★ | | ★ | | | | | | |

## Top 20 Games for the 64

| | TITLE | Publisher | Computer |
|---|---|---|---|
| 1 | **Ghostbusters** | Activision | C64 |
| 2 | **Raid Over Moscow** | US Gold/Access | C64 |
| 3 | **Daley Thompson's Decathlon** | Ocean | C64 |
| 4 | **Chiller** | Mastertronic | C64 |
| 5 | **Select One** | Computer Records | C64 |
| 6 | **Beach Head** | Access/US Gold | C64 |
| 7 | **Combat Lynx** | New Generation | C64 |
| 8 | **Scramble 64** | Interceptor | C64 |
| 9 | **Booty** | Firebird | C64 |
| 10 | **Jet Set Willy** | Software Projects | C64 |
| 11 | **Decathlon** | Activision | C64 |
| 12 | **International Soccer** | Commodore | C64 |
| 13 | **Flight Path 015** | AVS | C64 |
| 14 | **Eureka** | Domark | C64 |
| 15 | **Monopoly** | Waddington | C64 |
| 16 | **Suicide Express** | Gremlin Graphics | C64 |
| 17 | **Fighter Pilot** | Digital | C64 |
| 18 | **Son of Carnath** | Ultimate | C64 |
| 19 | **Bruce Lee** | US Gold/Access | C64 |
| 20 | **Blue Max** | Syn Soft | C64 |

Look out for the brand new 'Top 10' in the Saturday edition of the DAILY MIRROR EVERY FORTNIGHT.
The information for the Top 30 is compiled by N.O.P. Market Research Ltd, and founded by COMPUTER & VIDEO GAMES magazine in sponsorship with the DAILY MIRROR.




# Choosing a printer is a lot easier than choosing a computer.

THERE are dozens of quality printers from which to choose. With quality price tags of around £250.

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Being an impact printer, the M-1009 will print on virtually any paper, including letter headings, invoices and standard office stationery.

It will even print two copies together with your original.

**A superb character recommendation.**

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96 no less, plus international type and graphic characters.

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Its 9 pin dot matrix head, for example, has an astonishing 20 million character service life.

**One printer that doesn't block out the light.**

Many home computers tend to be a little on the large side.

In contrast, the compact M-1009, at only 7 cm high, keeps a discreet profile.

Well designed, reliable – and conscientious.

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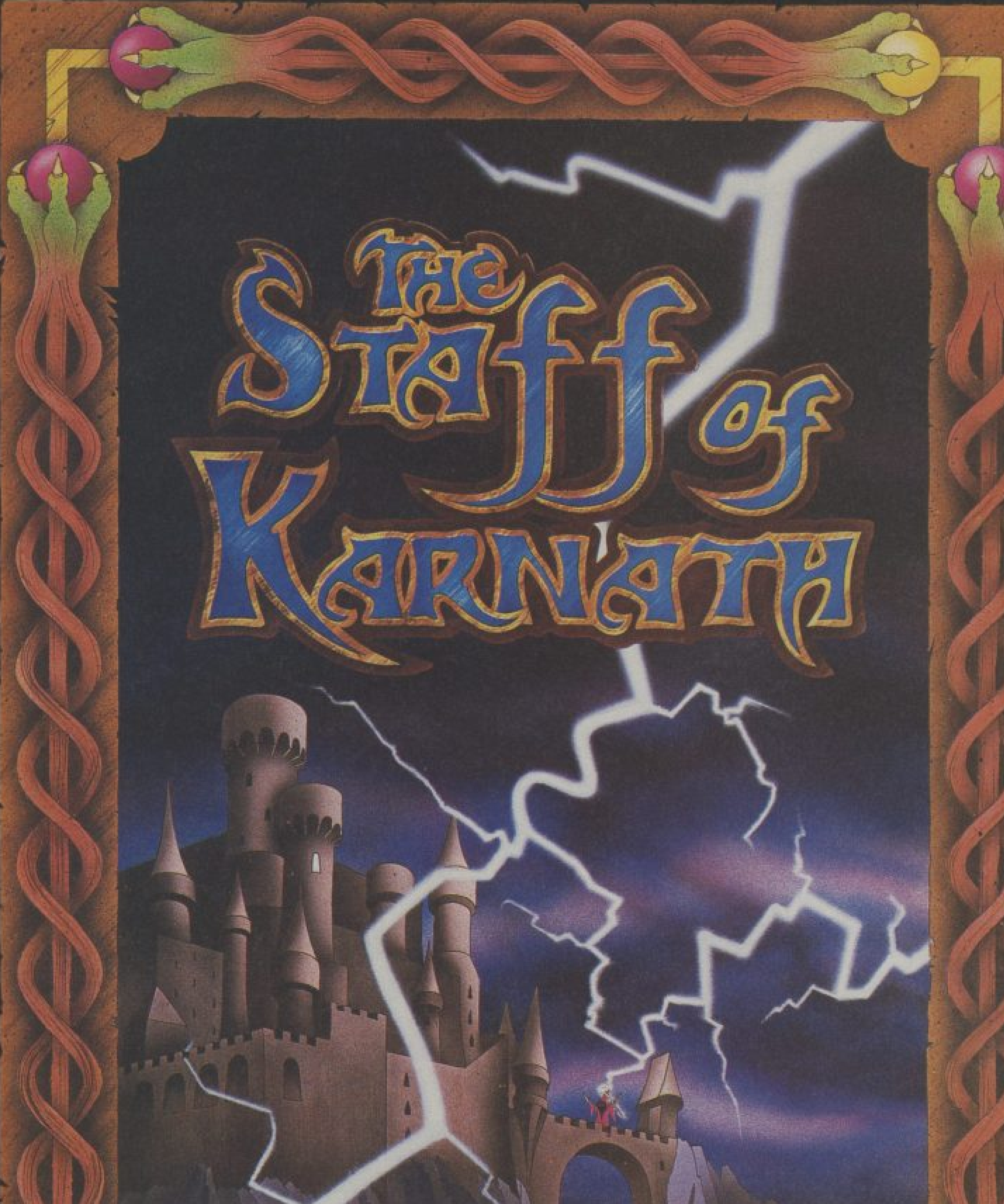
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# COMMODORE 64 (Joystick Compatible)




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by Robert Schifreen

**With Compunet and Micronet now accessible to the Commodore 64, we bring you a new regular column. Each month, The Happy Hacker looks at what's new in Compunet, Micronet and communications networks in general.**

**Got something to tell us? Why not drop us a line to: *Commodore User,* Priory Court, 30-32 Farringdon Lane, London EC1 3AU — or on Prestel page number *6001880.**

## SYSTEM SNIPPETS

Good news for Compuneteers fed up with the speed of the system. Compunet are working on some time-saving enhancements and, I'm assured, the system will be working up to three times faster in the near future.

Scrolling software for use with the Compunet modem will soon be available. If you've used Prestel you'll know that, after displaying a page, the screen clears and the next one starts from the top of the screen again.

Scrolling means that any text simply moves up the screen, just like a piece of paper in a typewriter.

The software is already complete and, when the documentation is finished, you'll be able to download it just like Viewdata and Terminal — the programs which allow you to access Prestel.

With this extra scrolling facility, you can use a Compunet modem as a terminal to other mainframes, and can log in to PSS. This is BT's data network, with access to many other computers. Details from your local BT sales office. Be warned, though, if my experience is anything to go by, they probably won't know what you're talking about.

## MUD SLINGING

A trigger product, in the case of a network, is a facility which, on its own, is grounds enough to make you subscribe. **Homelink**, for example, is a homebanking service. The average Homelink subscriber joins Prestel simply because Homelink is not available anywhere else.

MUD, a cult game among many micro owners, is set to be Compunet's trigger product. It's an adventure game, running in real time, which can support around twenty users at once. Each person logs in via a micro and a modem.

The rights to MUD were recently sold by its author Richard Bartle to Century Communications and the game has been made available on Compunet.

The present version is written for a DEC10 minicomputer, and a link is provided between Compunet and the DEC machine.

The only problem for the average user must be the cost. At £5 a month plus £3 per hour, playing MUD on Compunet isn't a cheap way of having fun.

If you're thinking of joining Compunet mainly to play the game, you might do better to think of joining PSS. You pay £25 initially, then £6.25 per quarter. Armed with your PSS identity number, you can gain cheap access to Essex University, where MUD is currently running for free.

Ironically, there's also a version running on a DEC10 in Oslo, Norway. No one knows how they managed to get hold of a copy of the program, but, through PSS, you can actually play MUD in Oslo. And it can still be cheaper than going through Compunet!

## COMMODORE MICROBASE

The Commodore area on Micronet starts on **page 800200**, and caters exclusively for the 64. The database was opened to coincide with the launch of the 64 modem — too soon according to some people. The main areas at the time of writing are:

- *features* (page 800203):- articles about using the 64. A good introduction to using the SID sound chip. Also, a rather sarcastic look at Simons' Basic.
- *hardware* (800205):- looks at Commodore-compatible peripherals. There's one section for equipment that has been tested and reviewed by Micronet, and one for any that hasn't.
- *ICPUG* (800201):- the Independent Commodore Products User Group has its own pages on Micronet. If you can't find what you want here, try Clubspot on page 810.
- *telesoftware* (600617):- for the 64 is rather scarce at the moment. There are a few games for downloading, including a range from Supersoft and Ocean. Although cheaper than in the shops, they're rather outdated.

Micromouse is rapidly becoming one of the most widely read areas of Micronet. Run by a database addict, many of his news stories come straight from the American networks and make an interesting read. A good place to find out what else you can do with a micro and a phone apart from using Compunet and Prestel. Most of it's legal, though some stories should carry a BT health warning!

Compunet has retaliated with CompuCat, which is set to develop a similar following.

## HOW SAFE IS SAFE?

You can't have missed recent TV and newspaper reports of various lapses in Prestel security. Someone even managed to find the ID number and password of the system manager, which gave access to any area on the database and any user's password.

Last month, Timefame International, one of the most widely read information providers on Prestel, claimed that its ID was 'hacked' just hours after the ID was changed. Why was it changed, you ask? Because of the hack the week before!

Prestel claimed that they had evidence which proved that this second break-in did not occur, and asked Timefame to withdraw their comments. They refused, and Prestel "terminated its agreement" with Timefame and removed their facility to use Prestel. At the time of writing, the Timefame database does not exist. If it does not reappear, many people will start asking whether Prestel did actually have something to hide.

If you use any system, change your passwords at least once every two weeks. In the case of Compunet, make sure that no one ever sees you entering your password or user ID.

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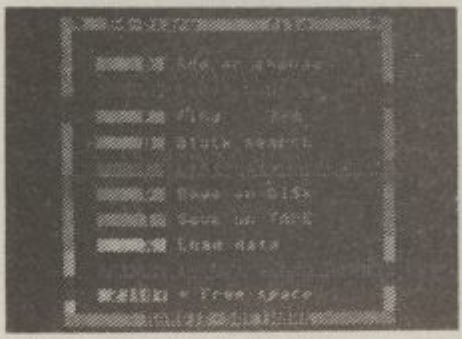
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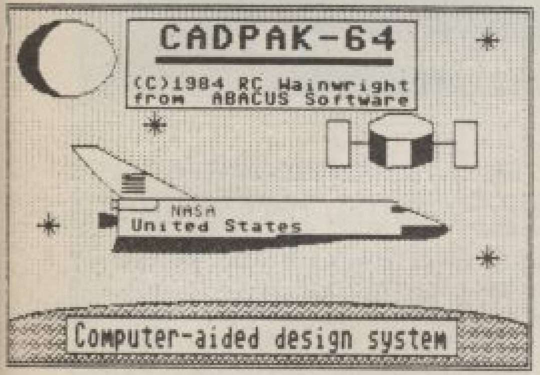
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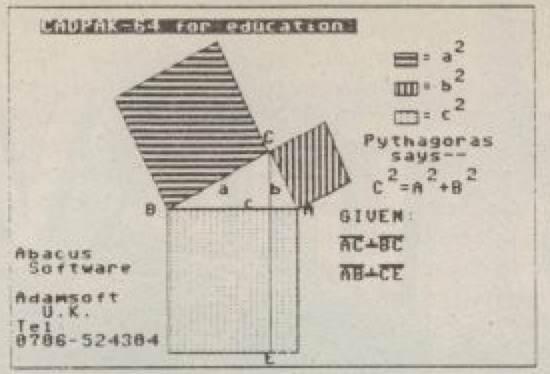
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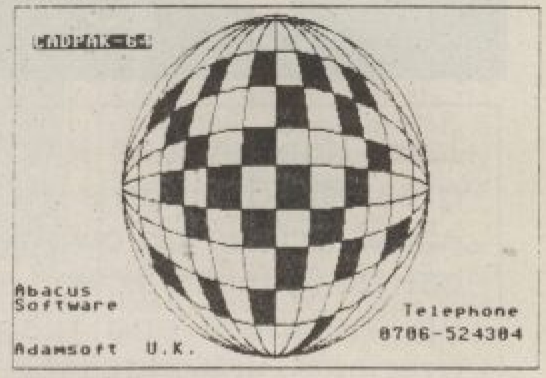
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**John Ransley has ignored (temporarily of course) the sackful of latest and greatest adventures we've hurled at him this month. Why? Because he's going about writing his own brain-twister, confident that, with the right tools, anyone can do (almost) as well as the near-mythical professionals. But how do you think up the ideas and plan them, how do you write the program, design the graphics, speed up the action and smooth out the rough edges? Read on . . .**

If you spent a goodly chunk of the Christmas and New Year break exploring one or two new adventures you've borrowed or bought, the chances are that you'll have been just a little disappointed with some aspects of at least one of them. And it's equally likely that you'll have said to yourself, 'I can do better than that'.

Sure you can. Yet you probably imagine that, whether you're attracted by the idea of creating a text, graphic or animated adventure, there are two big obstacles in the way of you ever coming close to the success of Scott Adams, Pete Austin or Philip Mitchell; that you lack their creativity and originality, and that you could never mimic their programming skills. Well, balrogs to all that.

## Get the idea . . .

First, remember that all three of those luminaries have openly borrowed from the ideas of popular authors — Mitchell from Conan Doyle and Tolkein; Adams from Robert Louis Stevenson and Bram Stoker; and Pete Austin from H G Wells. No reason why you shouldn't do the same. In the software swamp, where naff adventures lurk like pantomime crocodiles to good-naturedly swallow your wallet, it's not surprising that people respond more readily to the familiar. In general, you don't risk infringing copyright in the case of the original works of any author whose death occurred more than 50 years ago.

There are exceptions (such as in the case of contemporary editions of foreign-language works, where fresh copyright will be vested in the translator), but the software house interested in acquiring your game will check out this situation anyway. Besides, there's still no reason why you can't base an adventure or any other game on a contemporary work (*viz* **Ghostbusters, Erik the Viking, Danger Mouse**) provided you accept that the copyright holder must be paid a percentage of the sales. But as a 'name' will help to move more copies off the shelf anyway, your overall income is unlikely to be diminished — probably the opposite.

A stroll round your local library, bookshops and secondhand book dealers will provide you with more than enough inspiration for your own adventure. There are literary treasures all over the place just waiting to be discovered; hitting on John Masefield's forgotten children's classic *The Box of Delights* must have been the answer to a prayer by a TV producer looking for a serial to please youngsters raised on Dr Who, E.T. and Dungeons and Dragons.

There still remains the task of programming your adventure and then presenting it in a form that's professionally acceptable. Here, you can count yourself lucky. Crowther and Woods and the other pioneers of adventure authorship had to start from scratch — but with just one or two well-considered purchases, you can learn and apply everything they've ever known.

## Learning from books

I'm assuming that you have a pretty good grasp of Commodore Basic and aren't looking for books which teach the absolute fundamentals of topics such as string handling. But you will want to learn the ABCs of how to create an adventure and plan that all-important map on paper and then translate that into an attractive (and hopefully even marketable) program.

Then as you've passed the beginner stage, you'll want an insight into the more sophisticated techniques for achieving full-sentence input, independent action, graphics and animated interludes, and so on.

To get you on the right road, you can choose from Keith Campbell's **Book of Adventure** (Melbourne House, 138pp, £5.95), **Write Your Own Adventure Programs** (Usborne, 48pp, £1.99) and **Commodore 64 Adventures** by Mike Grace (Sunshine Books, 214pp, £5.95).




A friendly and chatty approach to the task is taken by Keith Campbell — and I'd better be careful what I say because not only is he the doyen of British adventure columnists (he's been writing our sister mag, *Computer & Video Games*, since the days when Babbage was the tea boy there). He's also about nine feet tall.

If you admit to even less confidence about tackling adventure authorship than I did at first, then Keith's book is definitely the one for you. It unravels the mysteries of the conventional adventure programming in bite-sized chunks and puts them to work in a compact mystery (there's a full listing for the 64) that

nevertheless incorporates all the techniques explained in the earlier chapters. Not being machine-specific, the book inevitably falls down in some respects (it lacks, for example, anything like Mike Grace's routines to SAVE an adventure at any point), but otherwise there's little to fault it.

In Mike Grace's effort, all the tricks the beginner needs are very clearly explained with the help of sample modules which quickly build into a simple demo adventure. This is the spring-board for a much more ambitious program which, again, is presented in modules that are amply explained along the way.

I have to admit to a certain bias in favour of this particular title because it was the one that nursed me through my first steps in adventure writing, and I've not found anything since that surpasses it in terms of clarity. Mike Grace's enthusiasm for his subject is infectious (so often, computer books read as though their authors are bored stiff by it all); his cheerful tuition really makes you want to start tapping away at the keyboard straight away.

## And more books . . .

I'm a great fan of Usborne's colourful and heavily-illustrated books and have already bought a number of their computer guides, even though I suppose they're meant for a younger readership. Don't care who's watching — I like the pictures. **Write Your Own Adventure Programs** by Jenny Tyler and Les Howarth could sell at twice the price and still be great value. Usborne's graphic house style is put to excellent use in conveying concepts such as object arrays in a visually appealing way; the map and grids for the demo adventure, for example, are little masterpieces. The main listing is in a universal Basic, with special machine-specific lines where necessary. These even include the sound effects; and any book that can confidently present, as this one does, SFX for a ghost falling out of a tree — and on a Vic 20 at that — just has to merit shelf space. Incidentally, certain POKES apart, you'd be able to implement all the Vic/64-specific routines and programs in these three books on the C16 and Plus/4 with only minor changes.

Other titles you should take a look at before making your final choice are **Creating Adventure Programs On Your Computer** by Andrew Nelson (Interface, £4.95) and Peter Gerrard's **Exploring Adventures on the Commodore 64** (Duckworth, 328pp, £6.95).

## Battling with Basic

So now you've worked out your storyline and map (perhaps with the help of Print 'n' Plotter's useful **Adventure Planner**, (£4.50), and it's time to labour at the keyboard. And as we all know, Basic 2.0 makes it more of a labour than it need be. Fortunately, there are no end of machine utilities which will help you overcome the most disagreeable aspects of Commodore Basic, which I've always suspected was written by an Esperanto tutor with a hangover.

The facilities offered vary enormously — from simple disk-handling and input validation on Commodore's own **Programmer's Utilities** (£14.99, disk only) to the excellent **BC Basic** cartridge bursting with nearly 100 extensions to make life really easy (Kuma, £57.50). Others worth evaluating include **The Tool** (Audiogenic, £14.95), **Help** (Stack, £25), **Gas Kit 64** (Anirog, £14.95), **Video Basic 64** (Adamsoft, £42), **Basic Plus** (J Morrison Micros, £7.95) and **Power 64** (Kobra, £75).

Many of these include simple commands for generating very sophisticated and hi-res screens of the kind that make Twin Kingdom Valley or Eureka! so watchable. Alternatively, you can buy programs which are for the sole purpose of transforming those 64,000 pixels into something like Dali might have painted for De Mille.

## Getting the graphics right

Be very careful what you buy in the case of graphics utilities. Some will only allow the designs they've been used to create to be screened if the utility itself is in memory. What you're looking for, of course, are programs which help you to create nice pictures which can then be incorporated in your own Basic programs. So far, I've discovered and tested three which meet this criterion.

The cheapest is (don't laugh) **Tony Hart's Art Master** (Commodore, £9.99/£11.99 disk) which comes together with four demo pictures to see what can be done. The program was actually written by David Byrden but I have enough regard for Mr Hart to believe that he wouldn't lend his name to anything tacky — and he hasn't. What you get is




a full-feature package that isn't particularly user-friendly but which will soon have you knocking out video art that would have taken you ages to produce otherwise. The instruction leaflet is average to excellent, and includes a simple routine for using the pictures — even as a games background for animated sprites — in your own programs. Jolly good.

Also available on tape is **Panorama (H)** by Andrew Colin (Talent Computer Systems, £17.95/£19.95 disk). With a 36-page instruction booklet packed with words and diagrams, it all seems rather daunting at first — but after a few hours of working through the examples and experimenting for yourself, you should begin to get some real value out of this very professional product. It has every feature you could possibly want and a few you've probably never thought of.

I'd be hard-pressed to choose between this and **Doodle!** (Quicksilva, £14.95 disk only) which is a little less sophisticated in some respects but offers much in other ways. For a start, it gets so friendly, it'll start the neighbours gossiping. For example, when you're working on a picture you can instantly toggle between all the menu and instruction pages to make sure you're going to hit the right button next. You can tuck a duplicate design away in memory so that if you spoil a picture with your next embellishment, you can call back the earlier version straight away.

## Graphics with tablets

With these three, you guide the cursor around the screen with the keys or joystick. Two other products which permit the generation of 'stand alone' pictures, but which I've not tried, use a stylus — which makes it much easier to copy from an original by simply 'tracing' over it. One is the pricey but, from all reports, virtually faultless **Koala Pad** (Audiogenic, £79.95), which now has the benefit of improved 64 software. The other is the marginally more affordable **Super Sketch** (Stonechip Electronics, £59.95), which appears to offer the advantage of a drawing board significantly larger than Koala's dinky 4 in. square pad.

One thing to remember above all is that all five of these products offer the facility of storing usually not more than one complete screen in memory at a time. So for tape adventures, their use is really limited to the creation of a knockout title screen for a text adventure. But if you're thinking in terms of disk, then of course you can cut the tracks with quite a number of pictures (though remember that they'll each occupy anything from 8K to double that), and call them up as needed.

## Compile and run

Come the dawn, and eventually you find that you've written your very first adventure. Trouble is, not only do all those IF...THENs and ON...GOTOs slow input responses to the speed of the average British Rail buffet car attendant, but all those florid text screens and natty graphics have left you just short of enough memory to hold the dynamic variables. Well, you should have written it in machine code, shouldn't you? Except that by the time you've done that, it'll be your successors who get your royalties and not you.

So buy a compiler and you'll find yourself in a new world. They're ridiculously easy to use and the results are invariably astounding. Just load the compiler into your 64, touch a couple of keys, load your original Basic program, and then wait for the compiler to do the rest. After a few minutes, you'll have a compiled version which you can SAVE

# Adventure

separately and which you or anyone else can RUN without the compiler itself in memory.

I've been using the disk version of **DTL-64 Jetpack** (Dataview-Wordcraft, £39.95) for some time now and I can't praise it enough. It's beautifully simple to use and I still find quite magical its power to effortlessly convert any of my Basic programs — however stodgy, inelegant and unstructured — into a sleek beast that's fast-loading, fast-running and memory-saving.

For example, a Basic subroutine for copying the ROM character set into protected RAM, creating several UDCs and flipping up a screen design incorporating them took 41 seconds to execute.

The DTL version takes nine seconds. DTL boiled down a sprite editor I wrote by more than 2.2K and doubled its speed of execution. And a compiled 32K text adventure not only slimmed down to just over 27K but gave a speed of response that made the game a pleasure and not a pain to play. Also, loading time from disk was cut by nearly a quarter to 75 seconds; tape loading would show a proportional improvement.

Incidentally, I could have tightened up even on these figures if I'd taken the trouble to add just one line to the original declaring which variables (virtually all of them, actually) could be treated as integers.

Bear in mind that such improvements will apply also to the speed at which hi-res pictures are drawn, at which sprites move (so you can incorporate some real arcade action), and so on.

Another, almost advantage, is that you can write the original Basic program with only one statement per line and with stacks of REMs — so that it's easier to understand (especially months later). This is because the compiler ignores all such window dressing and so they won't use up memory or slow execution.

I don't think you'd be getting anything more for the money if you plumped instead for **Petspeed** (£49.95) and the documentation's pretty pale anyway. But **Speedwriter** at around £40 from Codewriter and Stack's new **CBM 64 Compiler** at only £9.95 on disk must obviously be worth checking out.

## Dedicated to adventure

Then there's always **The Quill**. The capabilities of this innovative software will surely be familiar to you (if not, re-read Roger Jones' thorough appraisal in our December '84 issue). Codewriter's **Adventure Writer** comes from the same family. Gilsoft have developed an extension for The Quill which allows for the creation of graphic examples; let's hope there'll be a version for the Commodore family soon. Incidentally, don't let this news delay you from buying The Quill now; the graphics feature will be an add-on and won't replace the existing product.

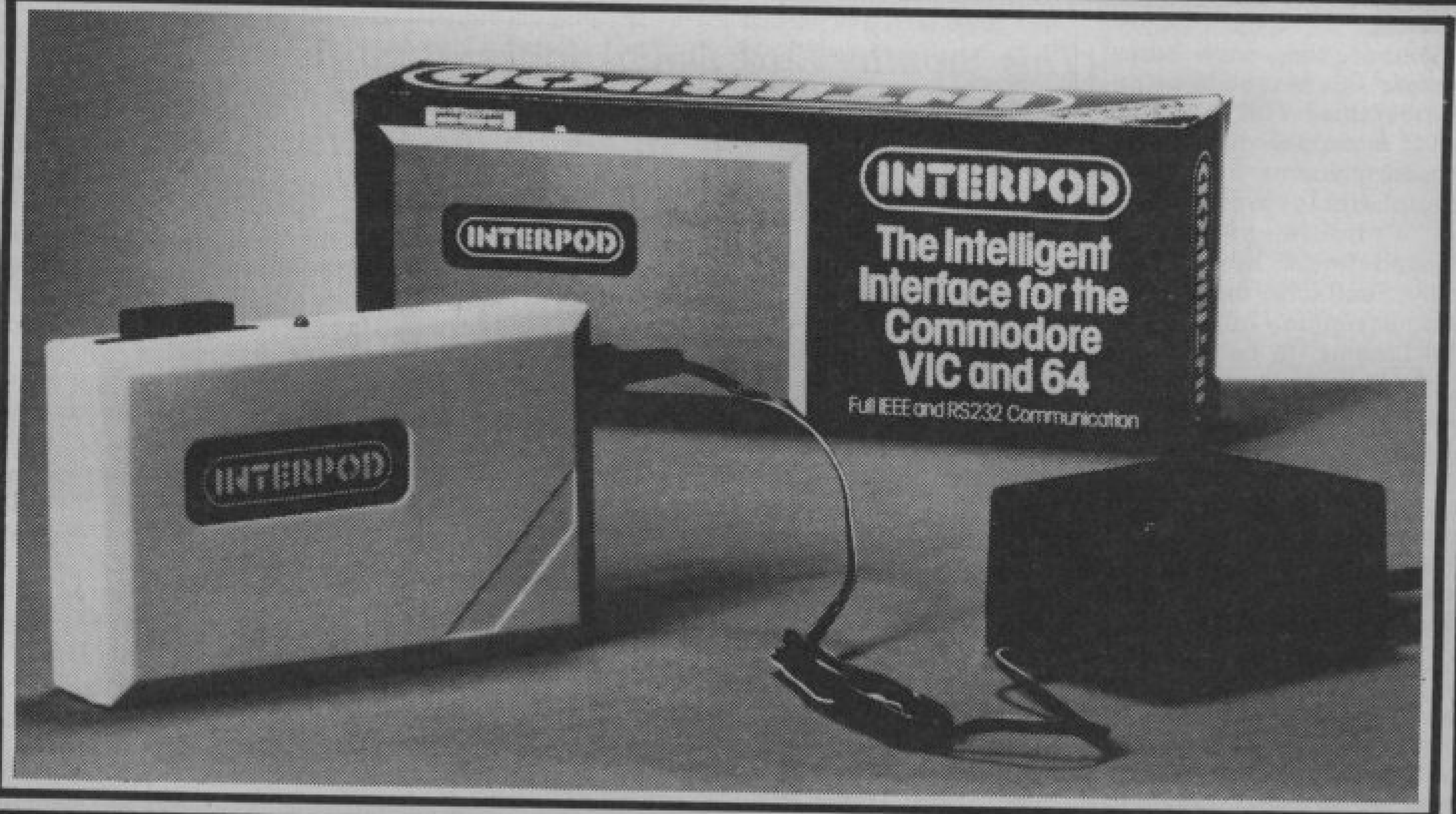
If your funds don't quite stretch to a compiler, you can at least do something to put some zip into LOADs and SAVEs, by processing your self-written programs (whether they be in Basic or machine code) through a utility which will convert it into a fast-loader. **Fastback** (Micro Centres, £9.95), **Hypersave** (Dosoft, £7.50) and **Zippo** (J Morrison Micros, £3.95) all do this with lesser or greater degrees of simplicity. A bonus is that programs so treated can't be listed or copied.

**Finally, a word about the use of compilers such as Jetpack or The Quill. Neither you nor any software house which publishes a program created with their help will be infringing any copyright. It's good manners to acknowledge the use of the utilities in the finished program's credit screen or accompanying documentation (as does Hampstead, for example, which was written on The Quill). Otherwise, people like Gilsoft and Dataview-Wordcraft don't expect a penny from you.**

**Which is pretty decent of them really, when you consider that their prodcts can transform your efforts into something which the likes of Adventure International, Level 9 or Melbourne House could make into a hit. Now, where did I decide to hide the clockwork goldfish . . ?**

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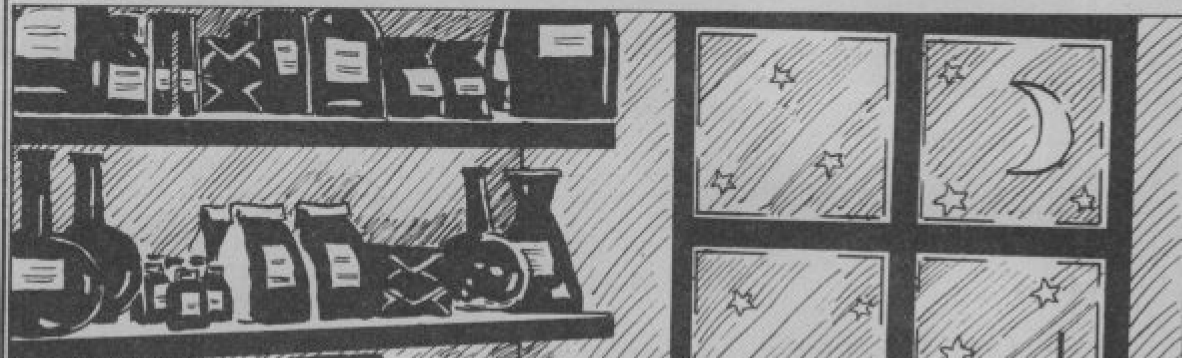
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# COMMODORE 64 ON PRESCRIPTION

**by Karl Dallas**

*This month, Karl Dallas looks at an interesting use for the Commodore 64 in small business. A High Street chemist shop, to be precise, in which the 64, together with a printer and software, is helping to make the dispensing of medicines easier.*



Remember the days when chemists' labels used to be indecipherable? The combination of a mumbled consultation with a doctor, an equally indecipherable prescription, and a bottle of pastel-coloured liquid bearing the barely readable description saying something gnomic like "The Linctus, to be taken as directed", must have been fairly lethal at times.

You may have noticed that things have changed, and that a lot of chemists' labels seem to have become computerised, so you still may not know what you're taking, but at least you can read it.

At the beginning of last year (1984), a combination of the professional Code of Ethics laid down by the Pharmaceutical Society and actual government labelling regulations, have meant that all labels on professionally dispensed prescriptions must be mechanically printed in some way, and they must carry the following information: the name of the patient, the name and address of the pharmacist, the date, the quantity contained and the warning: "Keep medicines out of the reach of children".

And there's more, the label must also contain the name of the product (or, if preferred by the doctor, something more vague like "The tablets", the doctor's instructions on how the medicine should be taken and any other cautions, such as "May cause drowsiness" etc.

With the average pharmacist dispensing at least 1000 different products, coping with all that was a bit of a chore — and indeed Boots the Chemists asked for and obtained a special dispensation allowing them to start operating the new rules only at the beginning of 1985.

A number of chemists use the Epson HX20 portable printer for this purpose. It has the advantage of a built-in microprinter that uses label-width paper, but its memory limitations, even in its expanded form, work against it. It is also rather slow.

## Commodore in Crewe

Thanks to a Crewe pharmacist, who first tried a system using the Commodore 64 in his seven retail shops and found it so useful that he's now set up a special company to market the system, more and more chemists are finding a Commodore 64 set-up abolishes the limitations that held back the portable system.

John Williams originally wrote the program on an Olivetti and transferred it to a Sirius, but while the 16-bit machine was very fast and efficient it was obviously out of the grasp of many of Britain's 10,500 chemists, pricewise, so he converted it for the cheaper and more accessible 64.

The program consists basically of tape or disk plus an EPROM which fits into the cartridge slot. As originally designed, the EPROM acted as a buffer for the printer and loaded the drugs available into the system above Basic, making more efficient use of memory.

But it's now being redesigned to put the entire program on to the EPROM, making it available on power-up. As it is, the program takes about three minutes to LOAD from disk, or 15 minutes from tape.

## Drugs in memory

The system comes complete with 800 of the most likely drugs pre-programmed into it, and the user can input a further 400. Any of these can be selected either by their initials or a code letter or number.

If the drug prescribed is not included in that 1200 drugs total, then it allows the name to be input specially.

The doctor's instructions are coded into three sections, the first being the quantity (eg "one tablet"), the second the action to be taken (eg "to be taken") and the third the frequency (eg "three times daily after meals") or whatever.

How it is taken is linked in the program with the drug name, so the second part of the instructions is automatic. There's no risk of the patient being told to rub an aspirin on his leg before taking a bath, as the programmer's son, Stephen, laughingly pointed out.

In all there are 24 pre-programmed instructions within the program, and the pharmacist can add up to six more. There are also warnings and advice, like not mixing certain drugs with alcohol, or to be taken with food.

**The program needs a Commodore 64, tape recorder or disk drive, an Epson FX80 or RX80 printer, and a monitor. The whole package, including the hardware, sells at £948.75 (£851 to members of the National Pharmaceutical Association), from Williams Applied Computers.**

# BUSINESS NEWS

## Graphics for Vizastar

That long-advertised and awaited program, *Vizastar*, looks as though it has finally got its act together after a number of false starts. At the time of writing, the very sophisticated graphics add-on has become available, making possible the preparation of pie and multi-bar charts as well as the simpler bar and line charts available in the basic package.

The good news is that the graphics program is copyable, so it can be put on to every data disk. The bad news is that if you've already got Vizastar, it'll cost you another £14.95 for the good graphics.

Meanwhile, we are now promised the equally long-awaited 8K extra-memory cartridge for Vizastar which will also include the special graphics, at an all-in cost of £129.95. And the Pet version, to run on the 8296 with between seven and eight times the number of records on the 8250 disk drive than is possible on the wheezy old 1541, should be out, too, at just under £250.

Of course, 64 users who also own a business Pet can get the advantage of larger (and faster) disk performance from the 8250 — as long as they have some kind of IEEE interface. Kelvin Lacey of Viza Software says the Interpod isn't really suitable and recommends instead a DAMS interface. Of course, since the Viza memory cartridge has to be in place, this should be one that permits one cartridge to be piggy-backed on to the interface. Viza Software is on 0634 813780.

## Packages from Practicorp

With the launch of the *Practifile* database, the PS programmable spreadsheet, the Practicalc II, a spreadsheet with WP option, Practicorp have now got what is a really powerful total package with a number of alternative options.

In many ways, Practicalc II can be considered as a more powerful version of the original program for the Vic and 64, with the addition of the word-processing option, which uses the "long label" facility to produce lines of text up to 100 characters wide, with most of the basic text formatting, block move, copy, delete etc functions available in a wordprocessing package.

The popularity of spreadsheets with "procedures", like Lotus 1-2-3 in the world of the more powerful PCs, has introduced the idea of programmable spreadsheets to the smaller user, and PS offers that facility. However, this is at the expense of a much smaller sheet: maximum size 2000 cells. The commands are in Basic, however, which don't require the learning of a special "macro" language, though some extra commands are also supported.

Practifile is a medium-power database, allowing a maximum of 20 fields per record, shared between a maximum of 254 characters, with no more than 79 characters per field and no more than 70 characters per field name. The number of records per file is dependent upon record size, but could be as many as 3876 on a 1541 or 7090 on an 8050.

All the Practicorp programs can access each other's files, but this facility is not too well documented.

Practifile costs £44.50; the other two new programs cost £69.50 each. More details on 0473 46271.

## Micro Swift pops up

Still on spreadsheets, Audiogenic have produced their Micro Swift spreadsheet, sharing the pop-up menu concept with their very excellent Micro Magpie, at £19.95, making it a really powerful, really friendly program at a really bargain price.

It has a total of 6600 cells — labelled A to Z horizontally and 1 to 254 vertically — though to be fair, most packages run out of memory before they run out of cell space.

The spreadsheet is programmable, and the program procedures can be called from a menu, or implemented directly. Four applications "templates" are included on the disk: home budget, car costs, loan analyser and expenses.

Audiogenic have obviously found some market resistance to their previous policy of cartridge-based programs with quite lavish manuals, since they have now produced both Magpie and Wordcraft on disk, at a lower price, with slightly abbreviated but still adequate manuals.

This now means that there are two Wordcrafts on disk for the 64, from Dataview (who wrote the program) for £49.95, and Audiogenic's for £24.95. Confusing!

## Busicalc threesome

Supersoft has announced three new versions of their Busicalc spreadsheet, for the Commodore 64 and for the 32K and 96K versions of the 8000-series Pets. The 64 version of Busicalc 3 costs £75 and offers nearly 2500 cells organised as up to 999 rows or up to 200 columns. Obviously, since the number of rows multiplied by the number of columns equals nearly 200,000 cells, you have to decide whether you want a tall skinny sheet or a short fat one.

There are 1500 cells organised into up to 750 rows or 200 columns on the 8096 for £125. The 8032 version, with 500 cells, also costs £75.

Busicalc 3 has "three-dimensional" calculating capability, meaning that sheets can be added or summarised on another sheet, and that formulae can be used to extract very sophisticated breakdowns of data on other sheets.

The 1541 disk version comes with a special fast loader, which cuts down LOADing time from 90 seconds without the loader to 30 seconds.

## Searching for Paper Clip

Who is importing Paper Clip (if anyone)? Callers to Kobra, the old importers, are referred to Handic, who deny all knowledge.

Some dealers have stocks, possibly from the time when it was freely available, and when they're gone there may not be any more.

A pity, since Paper Clip, from the Canadian company Batteries Included, is/was one of the best post-formatted word processing programs around, with sophisticated sorting and column move commands not generally available.

## Database from Handic

Meanwhile, Handic themselves are planning to launch a new database program, called Data Base 64, which has quite an attractive spec: 3800 records on a 1541 disk, record length between eight and 254 characters, spread across up to 18 fields of up to 27 characters per field.

It's claimed to be very fast, with an average of one second for search on a key (most DB programs are even quicker on the "next" search criteria, and possibly this will be no different).

It will work with all Commodore printers, including the 1526, which gives problems to some programs. Price is expected to be about £70. Handic is on 0344 778800.

Victuals

# EPIDEMIC —

*by Frank Rooney*

**Watch out, there are some nasty germs about! Oops, too late. Stanley has already contracted a disease. So now it's up to you, the antibody, to stamp out the germs before they reach epidemic proportions.**

To kill a germ you simply have to move into it. You can move vertically, horizontally or diagonally. The type of disease to be combatted is determined by which of the three skill levels you reach. Get to level three and you'll have the dreaded Leptospira Canicola infection to deal with. And the nastier the disease, the faster the germs multiply.

If the disease gets out of control then poor old Stanley will be forced to resort to penicillin. Your mission will have failed! Full instructions are included in the game.

```
10 GOTO990
20 POKESD+5,64:POKESD+6,128:POKESD+24,15:POKESD+4,33
30 POKESD+1,28:POKESD,214:FORSZ=1TO20:NEXTSZ
40 POKESD+1,57:POKESD,172:FORSZ=1TO10:NEXTSZ
50 POKESD+14,0:POKESD+4,0:POKESD+5,0:POKESD+6,0:RETURN
60 Q=0:GOSUB360:POKEW,A:POKEW+W1,6:T=0:TI$="000000"
70 IFQ=0THEN190
80 IFQ>5+5*DTHEN660
90 IFVAL(TI$)-T<4-DTHEN120
100 B=INT(RND(1)*897+S):IFPEEK(B)<>32THEN100
110 POKEB+W1,2:POKEB,Y:GOSUB20:POKEB,P:Q=Q+1:T=VAL(TI$)
120 M=PEEK(56321)
130 M=15-(MAND15)
140 IFV(M)=0THEN70
150 IFPEEK(W+V(M))=32THEN180
160 IFPEEK(W+V(M))=PTHENQ=Q-1:GOTO180
170 GOTO70
180 POKEW,32:W=W+V(M):POKEW,A:POKEW+W1,6:GOTO70
190 FORI=1TO100:POKE53280,INT(RND(1)*16):NEXTI:POKE53280,1
200 POKESD+5,64:POKESD+6,128:POKESD+24,15:POKESD+4,33:FORSY=1TO3
210 POKESD+1,34:POKESD,75:GOSUB230:POKESD+1,43:POKESD,52:GOSUB230
220 POKESD+1,51:POKESD,97:GOSUB230:NEXTSY:GOTO240
230 FORSZ=1TO50:NEXTSZ:RETURN
240 POKE198,0:PRINT"■■CONGRATULATIONS -"
250 PRINT"■YOU HAVE CURED STANLEY OF HIS DISEASE!"
260 POKESD+14,0:POKESD+4,0:POKESD+5,0:POKESD+6,0
270 FORI=1TO100:POKE53280,INT(RND(1)*16):NEXTI:POKE53280,1
280 SC=INT((1/VAL(TI$))*100*10↑D)
290 PRINT"■■■■■                    ■YOU SCORED";SC
300 IFSC>HSTHENPRINT"■■          ■ THE HIGHEST SCORE !!! ■":HS=SC:GOTO320
310 PRINT"■■          HIGHEST SCORE =";HS
320 PRINT"■■■■■ DO YOU WANT TO TRY AGAIN ? (Y OR N)■"
330 GETX$:IFX$="Y"THENPRINT"■":GOTO1130
340 IFX$="N"THENPOKE53281,6:PRINT"■■":END
350 GOTO330
360 PRINT"■■";
370 PRINT"::::::::::::::::::::::::::::::::::::::::";
380 PRINT":::::::::::■/‾‾‾‾‾‾‾‾‾‾‾‾\■::::::::::::::";
390 PRINT"::::::::::■|              |■:::::::::::::";
400 PRINT"::::::::::■|              |■:::::::::::::";
410 PRINT"::::::::::■/    ⊃o    ⊃o  \■:::::::::::::";
420 PRINT"::::::::::■|      *       |■:::::::::::::";
430 PRINT"::::::::::■\              /■:::::::::::::";
440 PRINT"::::::::::■|   ■-----     |■:::::::::::::";
450 PRINT"::::::::::■\              /■:::::::::::::";
460 PRINT"::::::::::■‾‾‾|      |‾‾‾■:::::::::::::::";
470 PRINT"::::■/‾‾‾‾‾‾‾‾‾      ‾‾‾‾‾‾■:::::::::::::";
480 PRINT"::::■|                     ■:::::::::::::";
490 PRINT"::::■|     /\              \■::::::";
500 PRINT"::::■|     | |             |■:::::";
510 PRINT"::::■|     | |      /\     |■:::::";
520 PRINT"::::■|     | |      | |    |■:::::";
530 PRINT"::::■\    /■::■\    | |    |■:::::";
540 PRINT"::::■|   |■:::■\   | |    |■:::::";
550 PRINT"::::■|   |■:::■|   /■::■\ |■:::::";
560 PRINT"::::■/   \■:::■|  /■:::■| /■::::::";
570 PRINT"::::■|||||■:::■| |■:::■| |■::::::";
580 PRINT"::::■OOOOO■:::■| |■:::■/ \■::::::";
590 PRINT"::::::::::::■|  |■::■|||||■:::::::";
600 PRINT"::::::::■__|  /\  |■:::■OOOOO■:::::::";
610 PRINT"::::::::■/   |■::■| |■::::::::::::";
620 POKE2023,58
```



```
630 W=1566:W1=54272:FORI=1TO6-D
640 B=INT(RND(1)*897+S):IFPEEK(B)<>32ORB=WTHEN640
650 POKEB+W1,2:POKEB,Y:GOSUB20:POKEB,P:Q=Q+1:NEXTI:RETURN
660 FORSY=1TO3:POKESD+5,64:POKESD+6,128:POKESD+24,15:POKESD+4,33
670 POKESD+1,6:POKESD,108:GOSUB700:NEXTSY
680 POKESD+5,64:POKESD+6,128:POKESD+24,15:POKESD+4,33
690 POKESD+1,4:POKESD,73:FORSZ=1TO500:NEXTSZ:GOSUB710:GOTO720
700 FORSZ=1TO30:NEXTSZ:FORSZ=1TO50:NEXTSZ
710 POKESD+14,0:POKESD+4,0:POKESD+5,0:POKESD+6,0:RETURN
720 POKE198,0:PRINT"  YOU FAILED !!! "
730 PRINT" POOR STANLEY WILL HAVE TO HAVE....":FORI=1TO1000:NEXTI
740 PRINT"    PENICILLIN ":FORI=1TO500:NEXTI
750 PRINT" "
760 PRINT"  ______  "
770 PRINT" /        \ "
780 PRINT"/       .  |"
790 PRINT"           |"
800 PRINT"          /"
810 PRINT"       \  |"
820 PRINT"  ___ /  /"
830 PRINT" /   /  /"
840 PRINT"/    |  |"
850 PRINT"     |  |"
860 PRINT"     |  |"
870 PRINT"  ___|  /"
880 PRINT"  /    _|"
890 PRINT" ___________________ "
900 S$="  "
910 S$=S$+"  ":FORH=1TO100:NEXTH:PRINT" "TAB(I)S$
920 FORI=24TO11STEP-1:FORH=1TO100:NEXTH:POKE55827,2
930 NEXTI
940 FORH=1TO30:POKE1435,78:POKE55707,2:POKE1555,77:POKE55827,2
950 POKE1435,32:POKE1555,32:NEXTH
960 FORI=20TO16STEP-1:PRINT" "TAB(1);:FORH=1TO100:NEXTH
970 PRINT"  ":NEXTI
980 FORI=1TO1000:NEXTI:GOTO320
990 S=1077:SD=54272:A=42:P=46:Y=81
1000 POKESD+14,0:POKESD+4,0:POKESD+5,0:POKESD+6,0
1010 POKE53280,1:POKE53281,1:PRINT" "
1020 PRINT"  "
1030 PRINT"  "
1040 PRINT"  "
1050 PRINT"  "
1060 PRINT"  "
1070 PRINTTAB(8)" (C) FRANK ROONEY 1983 "
1080 DIMV(10):FORI=1TO10:READV(I):NEXTI
1090 DATA-40,40,0,-1,-41,39,0,1,-39,41
1100 FORH=1TO5
1110 FORI=1TO300:NEXTI:READU:POKES+U,Y:GOSUB20:POKES+U,209:NEXTH
1120 DATA200,330,175,272,284
1130 PRINT"  DO YOU WANT INSTRUCTIONS ? (Y OR N)"
1140 GETX$:IFX$="Y"THEN1170
1150 IFX$="N"THEN1350
1160 GOTO1140
1170 PRINT" POOR STANLEY IS ABOUT TO CATCH A DISEASE"
1180 PRINT" AND IT IS UP TO YOU, THE ANTIBODY ( * ),"
1190 PRINT"TO STAMP OUT THE GERMS BEFORE THEY REACH"
1200 PRINT" EPIDEMIC PROPORTIONS."
1210 PRINT" THE ANTIBODY IS MOVED USING A JOYSTICK"
1220 PRINT"IN PORT 1."
1230 PRINT" THERE ARE 3 SKILL LEVELS WHICH DETERMINE"
1240 PRINT" THE TYPE OF DISEASE TO BE COMBATTED. THE"
1250 PRINT" NASTIER THE DISEASE - THE FASTER THE    GERMS MULTIPLY !"
1260 PRINT" YOUR SCORE IS BASED ON THE TIME TAKEN"
1270 PRINT"AND THE SKILL LEVEL."
1280 PRINT" YOUR MISSION WILL HAVE FAILED SHOULD"
1290 PRINT"THE DISEASE GET OUT OF CONTROL, IN WHICH"
1300 PRINT" CASE POOR OLD STANLEY WILL HAVE TO"
1310 PRINT"RESORT TO  PENICILLIN  !"
1320 PRINT"      PRESS SPACE TO CONTINUE  "
1330 GETX$:IFX$=" "THEN1350
1340 GOTO1330
1350 PRINT" SELECT SKILL LEVEL:"
1360 PRINT"      1  STAPHYLOCOCCUS AUREUS INFECTION"
1370 PRINT"          (A NASTY GERM)"
1380 PRINT"      2  ESCHERICHIA COLI INFECTION"
1390 PRINT"          (A NASTIER GERM)"
1400 PRINT"      3  LEPTOSPIRA CANICOLA INFECTION"
1410 PRINT"          (A REALLY NASTY GERM)"
1420 PRINTTAB(14)" PRESS 1 - 3 "
1430 GETD$:D=VAL(D$):IFD<1ORD>3THEN1430
1440 GOTO60
```



```
5 DIMJ$(4),SC(4),A(4),D$(4):AA=50
6 FORI=0TO4:J$(I)="VIC-20":SC(I)=AA:AA=AA-5:NEXT
10 PRINT"[CLS]":W$="H":C$="[G>A][G>S][G>Z][G>X]":GOTO150
20 PRINTE$"[CU]"SPC(M)F$E$SPC(M+1)"2[2CD]"D$"[2CD][CL]"D$"[2CD]2":RETURN
30 PRINTE$"[CU]"SPC(M)F$E$SPC(M+1)"3[CD]"D$"[2CD][CL]"D$"[2CD][CL]"D$"[CD]3":RET
URN
40 PRINTE$"[CU]"SPC(M)F$E$SPC(M+1)"4[CD][CL]"D$" "D$"[4CD][3CL]"D$" "D$"[CD][CL]
4":RETURN
50 PRINTE$"[CU]"SPC(M)F$E$SPC(M+1)"5[CD][CL]"D$" "D$"[2CD][2CL]"D$"[2CD][2CL]"D$
" "D$"[CD][CL]5":RETURN
60 PRINTE$"[CU]"SPC(M)F$E$SPC(M+1)"6[CD][CL]"D$" "D$"[3CL][2CD]"D$" "D$"[2CD][3C
L]"D$" "D$"[CD][CL]6":RETURN
70 PRINTE$"[CU]"SPC(M)F$E$SPC(M+1)"7[CD][CL]"D$" "D$"[3CL][2CD]"D$;D$;D$"[2CD][3
CL]"D$" "D$"[CD][CL]7":RETURN
80 PRINTE$"[CU]"SPC(M)F$E$SPC(M+1)"8[CD][CL]"D$" "D$"[CD][3CL]"D$" "D$"[2CD][3CL
]"D$" "D$"[CD][3CL]"D$" "D$"[CD][CL]8"
85 RETURN
90 PRINTE$"[CU]"SPC(M)F$;
92 PRINTE$SPC(M+1)"9[CD][CL]"D$" "D$"[CD][3CL]"D$" "D$"[CD][2CL]"D$"[CD][2CL]"D$
" "D$"[CD][3CL]"D$" "D$"[CD][CL]9":RETURN
100 PRINTE$SPC(M+1);
102 PRINT"10 [CD][3CL]"D$" "D$"[CD][3CL]"D$" "D$"[CD][3CL]"D$" "D$"[CD][3CL]"D$"
 "D$"[CD][3CL]"D$" "D$"[CD][3CL] 10"
105 RETURN
110 PRINTE$SPC(M+1)"J[2SPC][CD][3CL][G<A][G>*][G<S][CD][3CL][G>-] [G>-][CD][3CL]
[G>-]"D$"[G>-][CD][3CL][G>-] [G>-][CD][3CL][G<Z][G>*][G<X][CD][3CL][2SPC]J":RETU
RN
120 PRINTE$SPC(M+1)"Q[2SPC][CD][3CL][G<A][G>*][G<S][CD][3CL][G>-] [G>-][CD][3CL]
[G>-]"D$"[G>-][CD][3CL][G>-] [G>-][CD][3CL][G<Z][G>*][G<X][CD][3CL][2SPC]Q":RETU
RN
130 PRINTE$SPC(M+1)"K[2SPC][CD][3CL][G<A][G>*][G<S][CD][3CL][G>-] [G>-][CD][3CL]
[G>-]"D$"[G>-][CD][3CL][G>-] [G>-][CD][3CL][G<Z][G>*][G<X][CD][3CL][2SPC]K":RETU
RN
140 PRINTE$"[CU]"SPC(M)F$E$SPC(M+1)"A[2SPC][3CD][2CL]"D$"[3CD]A":RETURN
150 B$="[RED][G>U][3G>*][G>I][CD][5CL][G>-][REV][3G>V][OFF][G>-][CD][5CL][G>-][R
EV][3G>V][OFF][G>-][CD][5CL][G>-][REV][3G>V][OFF][G>-][CD][5CL][G>-][REV][3G>V][
OFF][G>-][CD][5CL][G>-][REV][3G>V][OFF][G>-][CD][5CL][G>-][REV][3G>V][OFF][G>-
155 B$=B$+"[CD][5CL][G>-][REV][3G>V][OFF][G>-]"
156 F$="[G>U][3G>*][G>I][CD][5CL][G>-][3SPC][G>-][CD][5CL][G>-][3SPC][G>-][CD][5
CL][G>-][3SPC][G>-][CD][5CL][G>-][3SPC][G>-][CD][5CL][G>-][3SPC][G>-]"
157 F$=F$+"[CD][5CL][G>-][3SPC][G>-][CD][5CL][G>J][3G>*
][G>K]"
160 S1=36876:S2=S1-1:V0=S1+2:C0=S1+3:F=50:POKEV0,15:P=0
170 M=2:T=0:POKEC0,93:IFF<=0THENF=0:GOTO900
175 P=P+1:IFP=11THEN1000
185 PRINT"[CLS][5SPC][REV][RED]HI-LO POKER"
190 PRINT"[HOM][CD][BLK]PTS:"FTAB(11)"GAMES:"P:PRINT"HI:"J$(0)" WITH"SC(0)
195 PRINT"[HOM][3CD][2CR]"B$"[HOM]"TAB(73)B$"[HOM]"TAB(78)B$"[CD][10CR]"B$"[HOM]
[2CD]"TAB(252)B$"[HOM]"
200 E$="[HOM][4CD]":GOSUB515
320 FORT=1TO4
330 GOSUB500
335 ONXGOSUB20,30,40,50,60,70,80,90,100,110,120,130,140:GOSUB400
340 IFL=5THEN170
350 POKES1,240+T:FORW=1TO300:NEXT:POKES1,0:NEXT
360 GOTO700
400 IFW$="H"ANDA(T)>BTHENL=0:RETURN
```

# FOR THE VIC-20 (UNEXPANDED)

```
410 IFW$="L"ANDA(T)<BTHENL=0:RETURN
420 L=5:F=F-10:FORZ=1TO150:POKES1-2,128:NEXT:POKES1-2,0:RETURN
500 B=A(T-1)
505 M=M+5:IFM>12THENE$="[HOM][14CD]":M=5
510 GETW$
515 X=INT(RND(1)*13)+1:Y=INT(RND(1)*4)+1:D$=MID$(C$,Y,1):A(T)=X:
D$(T)=D$
520 IFW$="H"ORW$="L"THEN530
530 PRINT"[HOM][BLK]":IFD$="[G>S]"ORD$="[G>Z]"THENPRINT"[RED]"
532 IFT=0THEN540
535 FORS=0TOT-1
536 IFA(T)=A(S)ANDD$(T)=D$(S)THEN515
537 NEXT:IFT>0THEN550
540 ONXGOSUB20,30,40,50,60,70,80,90,100,110,120,130,140
550 RETURN
700 FORZ=128TO254STEP.75:POKEC0,Z:POKES1,Z:NEXT:POKES1,0
705 FORJ=0TO3:IFA(J)=A(J+1)+1THENNEXT:F=F+150
710 FORJ=0TO3:IFA(J)=A(J+1)-1THENNEXT:F=F+150
740 FORJ=0TO4:FORK=0TO4:IFA(J)=A(K)THENF=F+5
750 NEXTK,J
760 FORJ=0TO3:IFD$(J)=D$(J+1)THENNEXT:F=F+100
```

**This is a card game based on the 'Play Your Cards Right' theme, in which you have to decide whether you want a low or high value card. Pairs, full house, flush etc are included and bonus points are awarded for any hands that appear in a winning sequence. You start with 50 points and you get ten attempts to reach a high score or go broke — the graphics and sound are pretty neat, too.**

Here's a description of how the program works:

*(see over)*

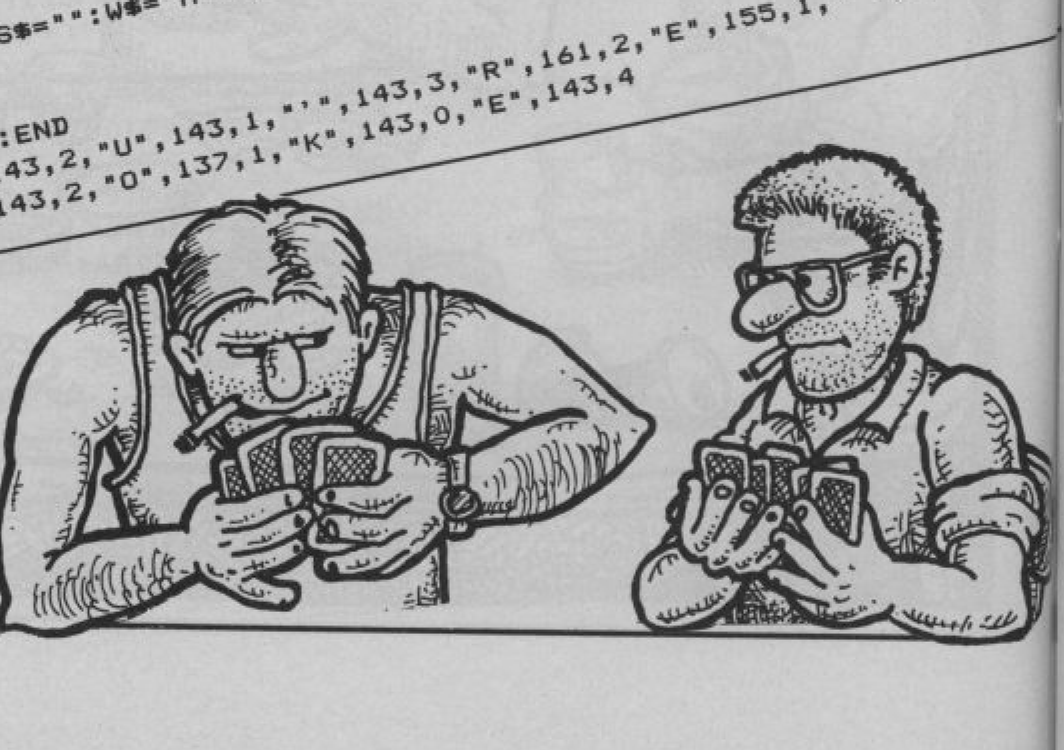


# Victuals

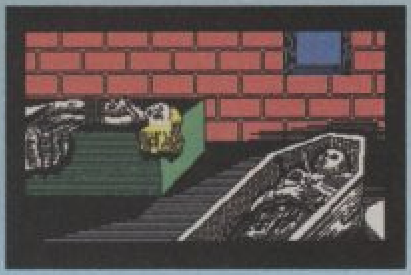
The main variables used are:-
B$ — Card face down
F$ — Card outline
A — Array to hold cards showing
D$ — Suit of selected card
W$ — Select Higher or Lower
M — To print card in correct position

**Line 10**
Set W$ to "H" to print first card
**Line 20-140**
Subroutines for each card
**Line 150-160**
Set variables for card face down, blank cards, sound, colour, and starting point (F)
**Line 170-200**
Set up initial screen with five cards face down and as W$ was set to "H" in line 10 goto card selection routine at line 515
**Line 320-350**
is a for next loop for each card
**Line 360**
Go to win routine at 700 if all correct
**Line 400-470**
Check for successful prediction and adjust accordingly
**Line 500-525**
Input prediction, card selection and positioning routine
**Line 530**
Selects the correct colour for the suit
**Line 535-537**
Checks that a card is not being duplicated by comparing the current card with those already showing. Selects another card if necessary.
**Line 540-550**
Go-sub to print card
**Line 700-790**
Win routine. Checks for any pairs, flushes, full house etc, adjusts points score and re-runs from line 170.
**Line 900-905**
Broke routine. Plays the Death March while printing You're Broke down the screen.
**Line 1000**
Checks if score is eligible for Hi-Score Table.
**Line 1002-1003**
Enter Name.
**Line 1005-1070**
Sort routine for Hi-Score Table.
**Line 2000-2070**
Print Hi-Score Table and Another Go?
**Line 3000-3010**
Data for Line 900.

```
790 GOTO170
900 PRINT"[CLS][BLK]":FORI=0TO11:READB$,P,Q:PRINT"[10CR]"B$:POKES1,P:FORL=1TOQ*2
00:NEXT
905 POKES1,0:NEXT
1000 IFF=<SC(4)THEN2000
1002 PRINT"[CLS][BLK]ENTER NAME (8 LETTERS)":INPUTJ$(4):SC(4)=F
1003 IFLEN(J$(4))>8THEN1002
1005 FORT=0TO3:E=0:FORS=0TO3:IFSC(S)>=SC(S+1)THEN1050
1010 M=SC(S):K$=J$(S)
1020 SC(S)=SC(S+1):J$(S)=J$(S+1)
1030 SC(S+1)=M:J$(S+1)=K$
1040 E=1
1050 NEXTS
1060 IFE=0THEN2000
1070 NEXTT
2000 PRINT"[CLS][BLU][5SPC][REV]SCORE:[WHT]"F
2005 PRINT"[CD][5SPC][REV][RED]HI-SCORES:[2CD][BLK]"
2010 FORI=0TO4:PRINTJ$(I)TAB(12)SC(I):NEXT
2020 PRINT"[HOM][13CD][2CR]ANOTHER GAME(Y/N)"
2030 GETW$
2040 IFW$="Y"THENRESTORE:S$="":W$="H":GOTO150
2050 IFW$="N"THEN2070
2060 GOTO2030
2070 PRINT"[CLS]BYE-BYE":END
3000 DATA"Y",143,3,"O",143,2,"U",143,1,"'",143,3,"R",161,2,"E",155,1," ",155,2
3010 DATA"B",143,1,"R",143,2,"O",137,1,"K",143,0,"E",143,4
```







Castle Of Terror is a suberb graphic adventure game set in the 1880's when and where "Dracula" stories abounded. You are in a village near a large Castle in which the secretive Count lives. You must travel about the village, collecting items which may be of use to you on your bold mission.

You must also find out what your mission is by talking to the right people. But don't be fooled!

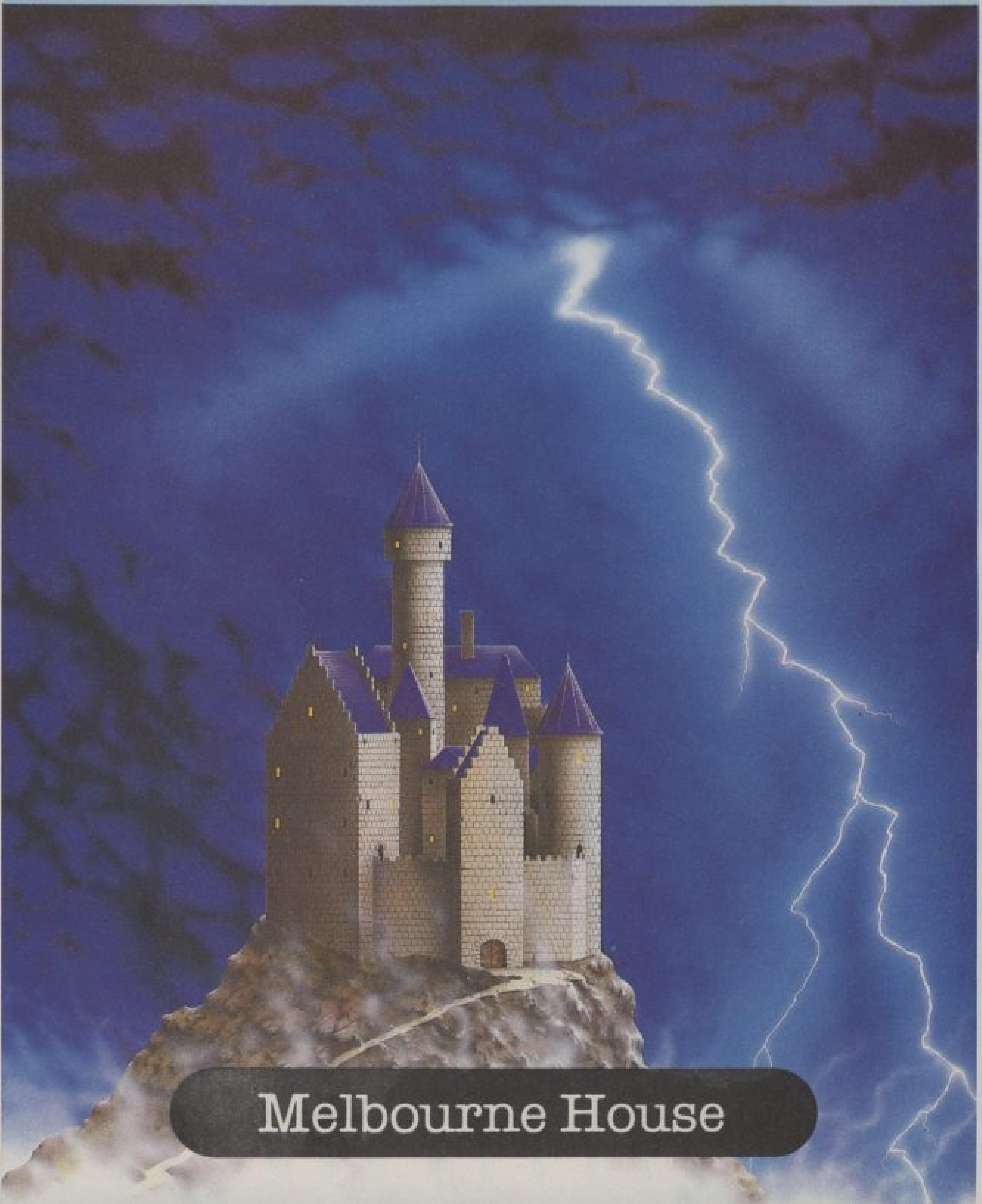
★ Multi-word "English Language" style input

★ Superb, highly detailed graphics

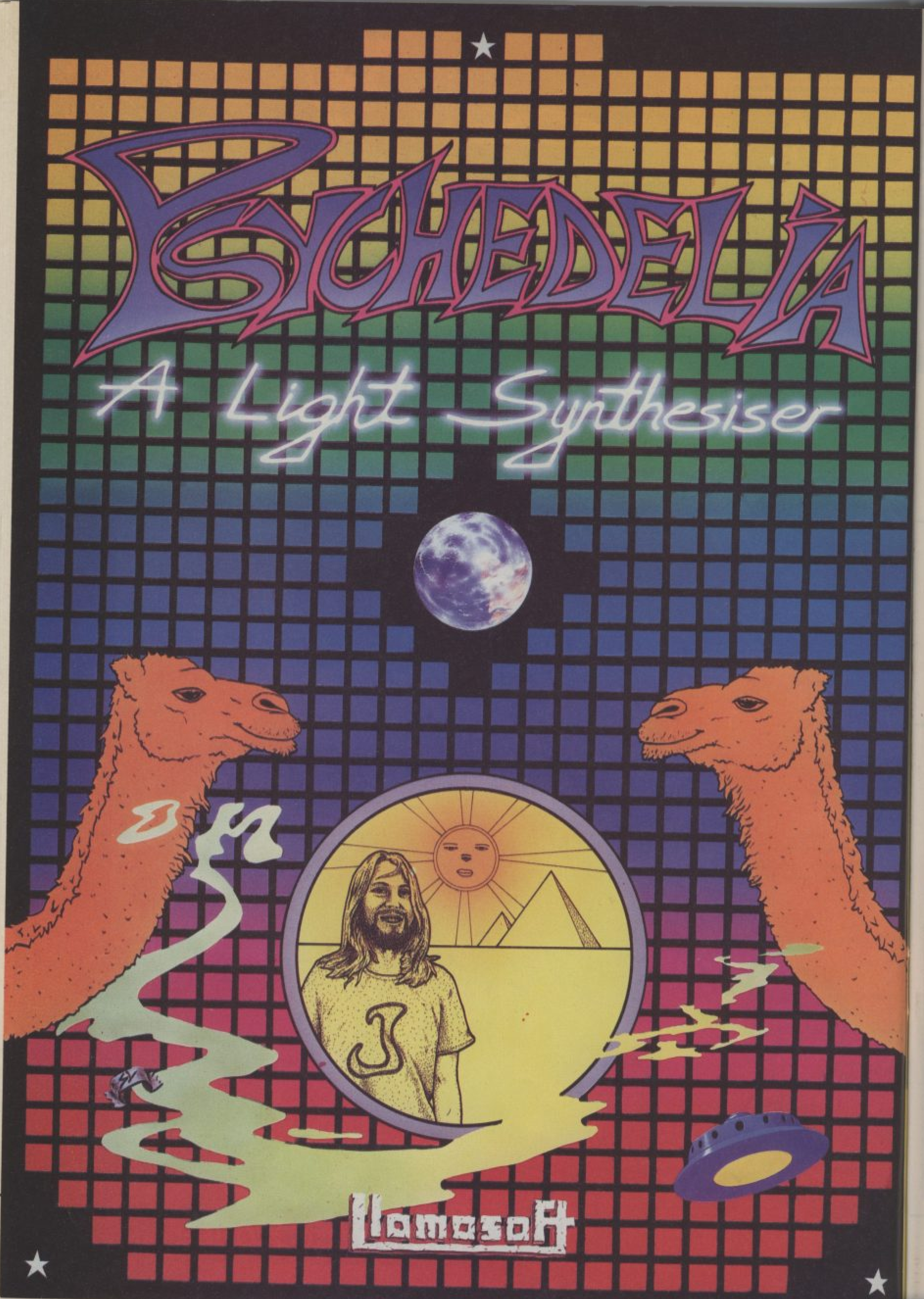
★ Animated characters, special effects and sound.

Surviving is success enough, but escaping with the treasure is the ultimate achievement and won't be easily accomplished!

# CASTLE·of·TERROR



Melbourne House


Psychedelia
A Light Synthesiser
Llamasoft

# TANK AMBUSH —




**The hunter against the hunted: hiding within the woods or lying behind hedges are devious infantrymen with dangerous heat-**

Title Screen and Instructions; Initialise game

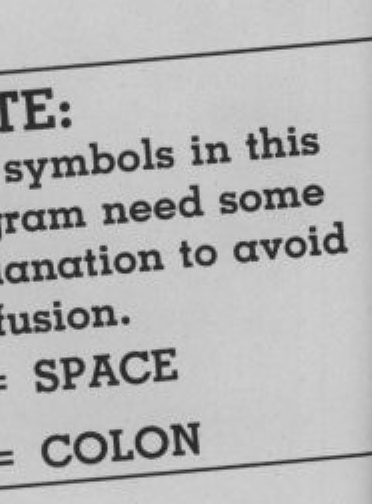
```
10 VOL 8:SC=3072:CL=2048:BR=7:COLOR0,2,BR:Y=12:X=0
20 PRINT "▒▒▒▒▒▒▒▒▒▒▒▒▒▒▲▒▲▒▲▲▲▲▲▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▲▒▒▲▲▲▲▲▒▒▒"
30 PRINT "▒▒▒▲▒▲▒▒▒▒▲▲▒▒"▲▒▲▲▒▲▒▲▲▲▲▲▲▲▲▲▒▲▲▲▲▲▲▲▲
40 PRINT "▒▒▒▲▲▲▲▲▲▲▒▒▒▲▒"▲▲▲▲▲▲▲▲▲
50 PRINT "▒▒▒▒▒▒▒▒▒▒▒▒▒▒INSTRUCTIONS"
60 PRINT "▒▒▒▒▒▒▒▒▒▒▒▒▒▲▲▲▲▒YOUR▲TANK":PRINT "▒▒▒▒▒▒▒▒▒▒▒▒▒▒▲▲(▒SHOOT▒)▲▲▒ENEMY▲MISSILE▲▲"
70 PRINT "▒▒▒▒▒▒▒▒▒▒▒▒▒▲▲▲▲▒LAND▲MINE▲▲▲▲▲(▒AVOID▒)":PRINT "▒▒▒▒▒▒▒▒▒▒▒▒▒/▒▒▲▲▲▒TREE/HEDGE▒▒▒▒▒▒▒▲▲▲▲▲▲▲▲▲▲"
80 PRINT "▒▒▒▒▒▒▒FIRING▲▲▲▲▲▲▲▲▲▲MOVEMENT"
90 PRINT "▒▒▒▒▒▒▒▒8▲1▲2▲▲▲▲▲▲▒▒▒▒▒▲▲▲▲▲▲▲▲Q"
100 PRINT "▒▒▒▒▒▒▒▒▲▲▲▲▲▲▲▲▒▒▒RETU▒▒▒▲▲▲▲▲▲▲▲▲▒\▒/▲▲▲▲▲▲▒"
110 PRINT "▒▒▒▒▒▒▒▲TO▲▲▲RN▒▒▒▲▲▲▲▲▲▲▲▲7▒▒▒3▲▲▲▲▲▲▲I▒▒▒P"
120 PRINT "▒▒▒▒▒▒▒▒BEGIN.▒▲▲▲▲▲▲▒/▒\▲▲▲▲▲▲▲▲▒"
130 PRINT "▒▒▒▒▒▒▒▒▒▒▒▒▒▒▲▲▲▲▲▲▲▒6▲5▲4▲▲▲▲▲▲▲▲Z"
140 GETA$:IF ASC(A$)<>13THEN 140
150 GOSUB 710:GOSUB 660
160 TB=PEEK(SC+40*Y+X):TC=PEEK(CL+40*Y+X)
170 POKE SC+40*Y+X,215:POKE CL+40*Y+X,0
```

**NOTE:**
**Two symbols in this program need some explanation to avoid confusion.**
**▲ = SPACE**
**⧗ = COLON**

Get Input; Move Missile In; Move and Fire Tank

```
180 GETA$
190 IF F$="F "THEN GOSUB 450
200 E=E+1:IF E<8-LVTHEN 340
210 E=0
220 POKE SC+40*EY+EX,EB:POKE CL+40*EY+EX,EC:SOUND 1,100
    0-ABS(EX-X)-ABS(EY-Y),2
230 IF EY=YANDABS(EX-X)>1THEN EY=EY+INT(RND(0)*3-1):
    GOTO 260
240 IF EY<YTHEN EY=EY+1
250 IF EY>YTHEN EY=EY-1
260 IF EX=XANDABS(EY-Y)>1THEN EX=EX+INT(RND(0)*3-1):
    GOTO 290
270 IF EX<XTHEN EX=EX+1
280 IF EX>XTHEN EX=EX-1
290 IF EY<2THEN EY=3:
300 IF EY>24THEN EY=24
310 IF EX<0THEN EX=1
320 IF EX>39THEN EX=38
330 GOSUB 670
340 IF A$=""THEN 180
350 POKE SC+40*Y+X,TB:POKE CL+40*Y+X,TC
360 IF A$="Q "THEN Y=Y-1:SOUND 3,400,10:IF Y<2THEN Y=2
370 IF A$="Z "THEN Y=Y+1:SOUND 3,380,10:IF Y>24THEN Y
    =24
380 IF A$="I "THEN X=X-1:SOUND 3,420,10:IF X<0THEN X=0
```

*Tank Ambush is taken from the Commodore 16 Games Book by Melbourne House.*






**seeking missiles.**

**These missiles will always home in on your tank. You can shoot them with keys 1 to 8, or manoeuvre by pressing Q for up, Z for down, I for left and Z for right.**

Have an enemy helicopter that fires heat-seeking missiles at your tank — shoot them or avoid them by manoeuvring. Introduce limited ammunition in the tank and ammunition dumps (where the tank must wait until it is reloaded). Give the killer tank hit points so it can suffer up to five hits before being destroyed. Also, create a repair station to fix up damages, and create the fuel for the killer tank and fuel dumps where it can refuel.

**Program Variables**

SC Screen memory
CC Colour memory
BR Background brightness level
LV Level of difficulty
TB, TC Character and colour beneath tank
F$ Fired flag
X, Y Co-ordinates of tank
E Delay for moving missile
EX, EY Co-ordinates of enemy missile
EB, EC Character and colour behind missile
SX, SY Howitzer shell co-ordinates
GB, GC Character and colour behind shell
D Firing direction
PT Score

```
390   IF A$="P "THEN X=X+1:SOUND 3,440,10:IF X>39THEN X
      =39
400   IF VAL(A$)>0ANDF$=""THEN F$="F ":SX=X:SY=Y:D=VAL(A$
      ):TS=0:GB=215:GC=0:SOUND 3,800,20
410   TB=PEEK(SC+40*Y+X):TC=PEEK(CL+40*Y+X):IF TB=42
      THEN 780
420   IF TB=43THEN TB=GB:TC=GC
430   POKE SC+40*Y+X,215:POKE CL+40*Y+X,0
440   GOTO 180
450   POKE SC+40*SY+SX,GB:POKE CL+40*SY+SX,GC
460   IF D=8ORD=1ORD=2THEN SY=SY-1:IF SY<2THEN SY=2:
      GOTO 640
470   IF D=2ORD=3ORD=4THEN SX=SX+1:IF SX>39THEN SX=39:
      GOTO 640
480   IF D=4ORD=5ORD=6THEN SY=SY+1:IF SY>24THEN SY=24:
      GOTO 640
490   IF D=6ORD=7ORD=8THEN SX=SX-1:IF SX<0THEN SX=0:
      GOTO 640
500   GB=PEEK(SC+40*SY+SX):GC=PEEK(CL+40*SY+SX)
```

Shell Collision With Missile; Increase Level

```
510   IF GB=215THEN GB=TB:GC=TC
520   IF GB<>81ANDEB<>43THEN 610
530   PRINT "■ ":IF BR=7THEN PRINT "■ "
540   SOUND 3,1000,15:PT=PT+1:PRINT "■■■■SCORE";
      PT:GB=42:GC=0:GOSUB 660
550   PU=PU+1:IF PU=LV+1THEN BR=BR-1:PU=0
560   IF BR>=0THEN 600
570   IF BR=-1THEN COLOR0,1:GOTO 640
580   BR=7:COLOR0,2,BR:LV=LV+1:IF LV>8THEN LV=8
590   FOR I=1 TO 500:NEXT:PRINT "■■■■■■■■■LEVE
      L ";LV;"▲COMPLETED ":FOR I=1 TO 1000:
      NEXT:GOTO 150
600   COLOR0,2,BR:GOTO 640
610   POKE SC+40*SY+SX,43:POKE CL+40*SY+SX,0
620   TS=TS+1:IF TS>10THEN 640
630   RETURN
640   POKE SC+40*SY+SX,GB:POKE CL+40*SY+SX,GC
650   F$="":RETURN
```

Initialise Enemy Missile Location

```
660   EX=INT(RND(0)*40):EY=INT(RND(0)*22+2)
670   EB=PEEK(SC+40*EY+EX):EC=PEEK(CL+40*EY+EX)
680   IF EX=XANDEY=YTHEN 780
690   POKE SC+40*EY+EX,81:POKE CL+40*EY+EX,0
700   RETURN
```

Display Score and Generate Background; End Game

```
710   PRINT "■■▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲TANK▲A
      MBUSH"
720   PRINT "■■▲▲SCORE ";PT;"/ ";LV+1
730   A=INT(RND(0)*50+50-6*LV)
740   FOR I=1 TO A:B=INT(RND(0)*920+80):POKE SC+B,65:
      POKE CL+B,53:NEXT
750   A=INT(RND(0)*30+30-3*LV)
760   FOR I=1 TO A:B=INT(RND(0)*920+80):POKE SC+B,104:
      POKE CL+B,88:NEXT
770   RETURN
780   POKE SC+40*Y+X,102:FOR I=1 TO 15:COLOR0,I:SOUND 3,8
      00+10*I,9:FOR J=1 TO 50:NEXTJ:NEXTI
790   COLOR0,2,7:PRINT "■■■■■■■■■■■■■■■■■■
      ■G▲A▲M▲E▲▲▲O▲V▲E▲R■"
800   PRINT "■■■■■■■■■■■■■■■■■■■■■■■■SCOR
      E ";PT;"/ ";LV+1:END
```

# SCREEN SCENE

## Gunslinger
**Vic 20 (+16K)**
**Keyboard or joystick**
**Omega**
**Price £1.99**

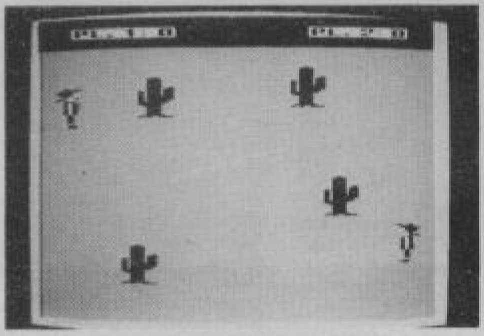
Presentation: ■■■■□
Skill level: ■■■□□
Interest: ■■□□□
Value for money: ■■■■■

Be of good cheer Vic owners, Omega are re-releasing established titles, thinly disguised, at rock-bottom prices.

This two-player game features a fully expanded arena for a quick-on-the-draw contest. I can't see any way of outsmarting the computer, unless you are a might quicker than a microchip — so there must be two of you for the game to be playable.

The gunslingers are readily recognisable as mean hombres as opposed to token squiggles. Cacti offer cover as does the occasional stagecoach and the cheery undertakers are on hand to tidy up. There really isn't too much to the game — just the duel, with good graphics and decent sound and if that's all you want . . .

If Omega continue with this policy there should soon be some ace games sloshing around at silly prices. Does it really matter it has been around for years?



## Dodo Lair
**Vic 20 (unexpanded)**
**Software Projects**
**Price £5.95**

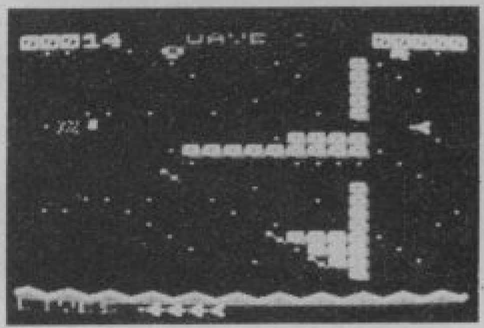
Presentation: ■■■■□
Skill level: ■■■■□
Interest: ■■■■□
Value for money: ■■■■□

To describe this space battle as franticly fast and furious is an understatement. I have been through all eight waves of Arcadia (a noted toughie), but I could hardly dent this one.

There is a technique . . . bob up and down to clear a path. Anyway, the old faithful spacecraft has been unleashed against a host of megarrific aliens who are cemented together by their loyalty to a Dodo. There are nine waves to survive: you are static while the horrendous hordes scroll your way, lobbing the odd star shell or something similar.

The purple meanie missiles must not be allowed to reach your side of the screen while the more you blast at the Buildas, the quicker they multiply. Smash through using a shield, unless you can shoot faster than they can breed.

This has good battle sounds, bright colours and is well worth the frustration it causes.



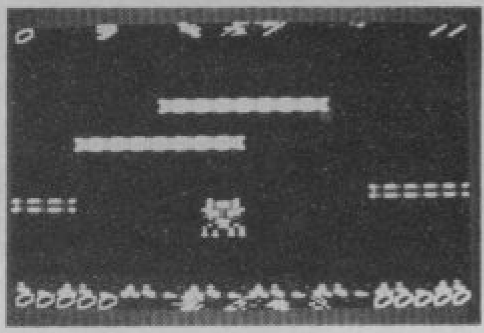
## Fatty Henry
**Vic 20 (unexpanded)**
**Software Projects**
**Price £5.95**

Presentation: ■■■■■
Skill level: ■■■■□
Interest: ■■■■□
Value for money: ■■■■■

Many 3.5K Vic games are blighted by crummy graphics and threadbare scenery — often just the one screen.

One solution employed by considerate authors is the expanded screen with jumbo characters. Another option has been adopted here . . . multicolour-mode.

The place is a hot oven, the first of ten and the heat is on. Your only hope of not ending up as calamari is to pick up drops of water condensing on a pipe and quench the flames before the temperature hits boiling point. Sizzling fat spurts up and all that cholesterol can't be too good for your general health. Apart from fresh layouts replete with blocking ledges and oven foam to boot, there's a pugnacious pooch (him of the title) to contend with. Deserves to be bought.



## Battleground
**Vic 20 (unexpanded)**
**Keyboard or joystick**
**Omega**
**Price £1.99**

Presentation: ■■■□□
Skill level: ■■■□□
Interest: ■■■□□
Value for money: ■■■■■

Originally imported from Germany by Anirog and now doing the rounds again with a different cassette insert.

You control a wedge-shaped flying machine which also doubles as a gun-cum-fortification maker. Dodging about behind barricades, you exchange fire with trundling armoured vehicles. These have to be weak before they crumble.

To keep the interest going, each armoured wave is of a different mark (I saw four types), yet the graphics are too small to be worthy of any attention in their own right.

At least the format is entirely distinct from the two-up Tank Duel efforts and does allow for tactics to be evolved.

This is a value for money shoot-up with ten levels of skill.



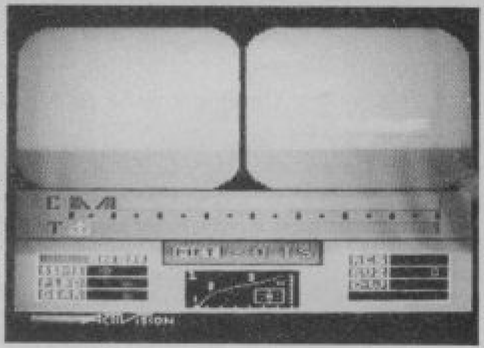

## Space Shuttle
**Commodore 64**
**Activision**
**Price £9.99**

Presentation: ■■■■□
Skill level: ■■■■□
Interest: ■■■□□
Value for money: ■■■□□

You are in the hot seat of the Space Shuttle Discovery. The object is to achieve orbit, dock with the satellite as many times as you can and, finally, point the thing Earthward and land it.

As you can imagine all of this is not accomplished without a little difficulty, which is why those nice people at Activision give you a 36 page flight manual to help you work it out. Like most flight simulators the game relies less on manual dexterity than the ability to simultaneously read a dozen different instruments and make appropriate course changes.

It should prove a challenge to all but the most accomplished simulator pilots. Graphics are good and sound, whilst used sparingly, is realistic.



# SCREEN SCENE

## Bear George
## Commodore 64
## Cheetahsoft
## Price £6.95

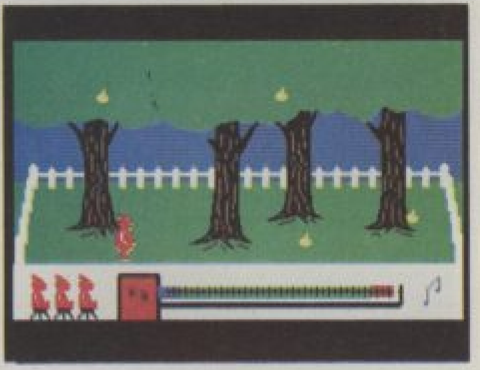
Presentation: ■■□□□
Skill level: ■■■□□
Interest: ■■■□□
Value for money: ■■□□□

A hungry looking Bear George is wandering around in the orchard looking for windfall apples to eat, so he can become fat enough to go and hibernate.

To hinder you further a pesky squirrel keeps dropping nuts from the boughs above. If one of these hits George on the head it causes him to fall on his bum and lose some of his hard-earned fat.

After munching apples George is magically transported to a holiday skiing resort. George must make his way to his cave avoiding such hazards as manic skiers, spiders, and a caged truck which carts him back to the orchard if he's not fat enough to go bye byes for the winter.

I tired of this game fairly quickly. The two screen scenario is limiting and leaves much to the imagination. The graphics are at best average and at worst badly programmed.



## Snokie
## Commodore 64
## Funsoft/U.S Gold
## Price £9.95 cass
## £12.95 disk

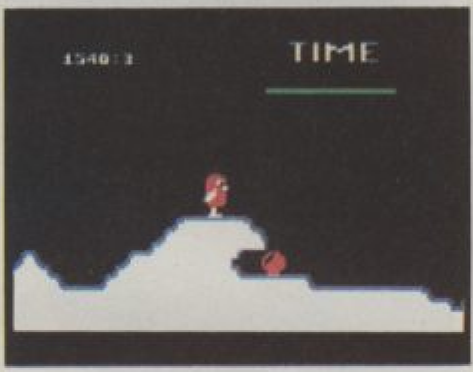
Presentation: ■■■■□
Skill level: ■■■■□
Interest: ■■■■□
Value for money: ■■■■□

The theme to this game is a familiar one. The hero is a character called Snokie, a cute looking pink penguin, who can jump pretty well but can't fly. Contact with water usually proves fatal.

Snokie's most immediate concern is that his girlfriend Cara has been abducted by the evil Grodies (boo hiss).

You have to guide Snokie through seven screens to reunite him with Cara. There are hazardous glaciers with deadly boulders to be negotiated, moving ice floes to be hopped across, and falling icicles which threaten to spear you at every move.

The graphics are imaginative and well done. When Snokie cops it a skull appears in his place accompanied by a catchy little tune. On the whole the game is very enjoyable and highly addictive.



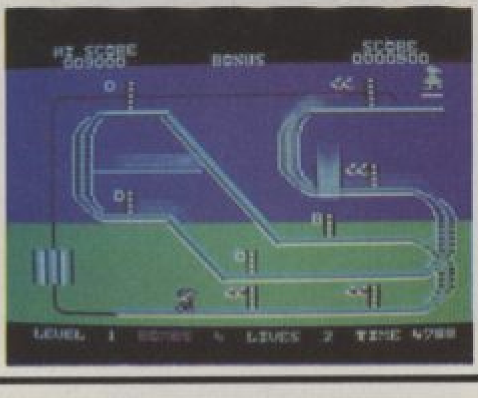

## Kong Strikes Back
## Commodore 64
## Joystick only
## Ocean
## Price £7.95

Presentation: ■■■■■
Skill level: ■■■□□
Interest: ■■■■□
Value for money: ■■■■■

This time round our Thrilla Gorilla arch enemy has taken a fancy to roller-coasters. Barrels are out, cars are in. These respond to the laws of gravity by changing pace on the slopes — a trap for the unwary.

Armed with four bombs, you must reach the top of the switchback to effect a rescue. Grab the various bonuses from the ladders and prepare for the second of the four tortuous circuits. From now on fairground objects exert a stronger influence on the proceedings and even custard pies muscle in on the action.

A worthy follow-up to the original, with a well developed theme, right down to the hurdy-gurdy music. The screen spills over into the border, reflecting the overall quality of this program: in fact everything has been refined and polished for maximum enjoyment.



## Raid On Bungeling Bay
## Commodore 64
## Ariolasoft
## Price £9.95 cass
## £12.95 disk

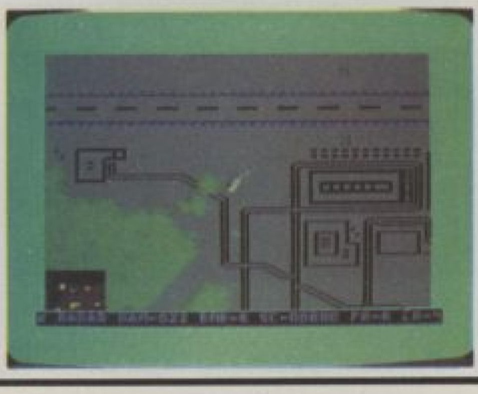
Presentation: ■■■■□
Skill level: ■■■■□
Interest: ■■■■□
Value for money: ■■■■■

The story so far. The evil Bungeling Empire is churning weapons out of its six computer controlled factories. Could it be their aim is universal domination?

Each of their factories is on an island and is well protected by ground and air defences. On your side you have five helicraft equipped with nine bombs and an unlimited supply of missiles. Your base is the helicraft carrier and you can return here to repair damage and restock with bombs.

The objective is twofold. Firstly to bomb the factories out of existence, secondly to defend your carrier. The game requires more attention to strategy than your average 'shoot 'em up'.

Graphics are well used and the wrap around screen adds to the realism of it. Nice touches include a newspaper story and victory parade if you are successful.



## Starace
## Commodore 64
## Mastertronic
## Price £1.99

Presentation: ■■□□□
Skill level: ■■□□□
Interest: ■■□□□
Value for money: ■■■□□

Starace is one of Mastertronic's £1.99 range and as far as this one is concerned I'd say it was overpriced.

The planet Alpha One is dying and the humanoid inhabitants have to find a new home. You are one of the space fighters sent out to accomplish this task. On your quest you must travel through five galaxies.

In Galaxy One three of the aforementioned aliens attack your ship and as you can't fire back you must run away!

In Galaxy Two, you must avoid the asteroids and fireballs. There aren't that many of them so colliding with them is probably almost as difficult as avoiding them. Galaxy Three is more interesting. Pilot your ship into the gravitational beam of the mother ship to achieve docking whilst avoiding the asteroid shower (more of a light drizzle).

This version is much too easy to be any fun.



# SCREEN SCENE



## Cadcam Warrior
## Commodore 64
## Taskset
## Price £9.95 cass £12.95 disk

Presentation: ■■■■■
Skill level: ■■■■■
Interest: ■■■■□
Value for money: ■■■■■

CADCAM is an acronym for Computer Aided Design-Computer Aided Manufacture which is a reality here and now. But for the purposes of the scenario we have jumped into the future to arrive at the inception of a new processing unit. Cadcam Technology have booked a whole floor at the 25th Cadcam International Show to demonstrate their remarkable machine. Naturally security is tight. Problem is the machine's gone up the creek and no-one can break the security to fix it. The memory bank dedicated to human needs has gone down. There is no time for a major overhaul but there is time to send in the mini-android MAD 2.

He must work his way across a series of 3D metal plates, exploring both surfaces and taking the necessary steps to clear each screen of the system's defences

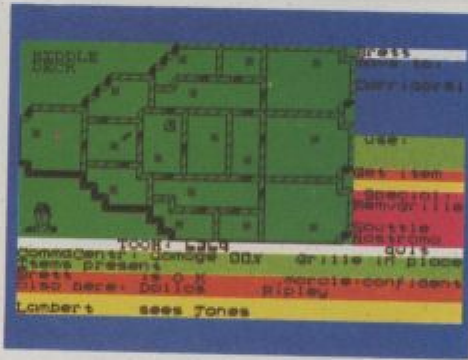


## Black Thunder
## Commodore 64
## Quicksilva
## Price £7.95

Presentation: ■■■■■
Skill level: ■■■■□
Interest: ■■■■□
Value for money: ■■■■■

Loco was a great game from the self-taught Tony Crowther, written while he was with Alligata. While awaiting (eagerly!) for the follow-up on the Gremlin Graphics label in zoomed Black Thunder courtesy of Quicksilva. Never look a gifthorse in the mouth, even if it is mutton dressed up as lamb. Loco now looks positively homespun by comparison, as you stealthily ease into the purple death mobile.

Your ambition is to escape from the confines of a futuristic city; Mr. Nasty's aim is to keep you there. As you make a dash for it, it dawns on you that droid tanks are careering towards you; helicopters and missiles are tracking from behind and somewhere above are malevolent UFOs, which seem indestructible from where I'm standing. You're bristling with shells, a forward and a rear gun (you control the

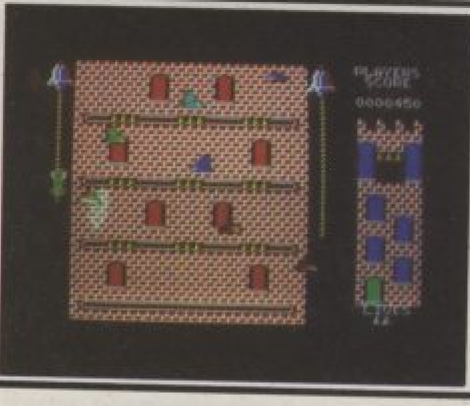


## Alien
## Commodore 64
## Argus
## Price £8.99

Presentation: ■■■■□
Skill level: ■■■■□
Interest: ■■■■□
Value for money: ■■■■□

Try and kill the alien by commanding the crew to move around the ship and carry out various instructions. The alien can be killed either by shoving it out of an airlock or by self destructing the ship and evacuating (only if there is nobody left alive). You have to take Jones, the ship's cat, with you. Mother, the ship's computer, won't launch the lifeboat if you've left anyone behind.

Three types of information are displayed on the screen for three decks on the Nostromo and you can obtain a map of any one of them. Each map gives details of room locations, stairs to other levels, and positions of grills. Instructions are given to the crew using the Command Monitor. This enables you to select individual crew members and instruct them using a menu system, though the crew may not always obey you. Each of them has their own personality

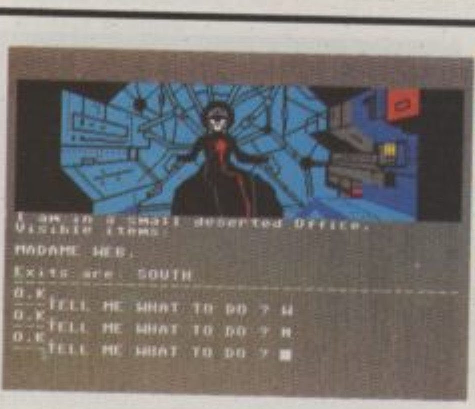


## Hunchback II
## Commodore 64
## Joystick only
## Ocean
## Price £7.95

Presentation: ■■■■■
Skill level: ■■■■□
Interest: ■■■■□
Value for money: ■■■■■

Level or platform games are almost two-a-penny these days. Well, this offering probably won't lead to early retirement for all at Ocean but it does have plenty going for it. It has an identity, it's not Jet Set Willy in dark glasses nor Chuckie Egg in drag. No, this climbing caper exudes the aroma of old Notre Dame, cartoon style.

Quasimodo and friends will keep you wiggling the joystick during many hours of compelling play as you strive for the next screen. The denouement centres around a clock tower, with clockwork mechanisms, cogs and winding gear . . . all Hunchback mincemeat-makers. Of course, there are also the bells, the bells! These replace the standard power pills or keys. Mopping-up the complete set leads you further up the clock tower where you get to ring the



## Questprobe featuring Spiderman
## Adventure International
## Price £6.95

Presentation: ■■■■□
Skill level: ■■■□□
Interest: ■■■□□
Value for money: ■■■□□

If you like Marvel comics — even though DC are better — I'd say there's a fair chance that this will be your kind of thing. It's another Scott Adams adventure game, this time featuring Spider-Man.

In your travels you bump into many of Spiderman's foes — Doctor Octopus, Hydro-Man and Mysterio to name but three.

The big problem with Spiderman's foes is that they might just as well be blocks of stone. I tried kicking Hydro-Man and he remained inert. So, after a pause for thought I decided that jumping on him from the ceiling would probably do the trick. Still no reaction.

Shouting abuse was equally ineffective. Perhaps I needed more points before Hydro-Man would take any notice of my kicking and foul language. Either way I felt there was a definite lack of action considering the abundance of evil arch-criminals and superheroes.

(by shooting, gathering or whatever) to enable further progress. The defences are computer generated making everthing logical — it's up to MAD 2 to crack the pattern and decipher the internal architecture to facilitate the journey to plate 8,192.

Each plate is depicted in full perspective, with ridges and holes connecting the two surfaces. The action is pure arcade reinforced with interlacing puzzles; in fact it's almost a project. The challenge of Cadcam Warrior lies in the tactical problem of plotting your way through 8,192 screens using as many short-cuts as possible. Must be described as innovative and fresh. Taskset regard Cadcam as their best yet. Having just seen Beside the Seaside I disagree — see next month's User and decide for yourself.

---

altitude of fire on this one) and you can look forward to grabbing further supplies of ammo en route. Put up a defensive umbrella, but be cagey.

The screen is divided horizontally: the lower portion is a scrolling radar display of the road network (which makes Spaghetti Junction look like a slip road) showing your position and the approach of danger. The business half is a constantly moving panorama of the cityscape with the interceptors superimposed. You can watch your missiles launch, judge their height and thrill to direct hits.

Apart from a tingling tune the program speaks to you: "Get ready"; "Game over"; Your score is . . ," which gives it an arcade feel, but may also get on your nerves after a while.

Tony Crowther's next game will also be on the Quicksilva label.

---

and if you instruct a queasy crewmember to attack the alien they may think twice. Another complication is that one of the crew is an android and you don't know which one it is.

If a crew member is attacked by the alien the map area fills with a large image of the writhing monster. This can be quite unnerving. There are a number of possible conclusions to the game. If you are ultra successful the alien can be killed with no crew losses. Alternatively, you can bungle the whole thing by running out of oxygen or setting the self destruct and not giving yourself time to launch the shuttle.

However well you do, the game remains exciting, nail biting stuff. 'In space no one can hear you scream' the blurb says. My neighbours aren't so fortunate — I've been giving them a hard time. But who needs neighbours with entertainment like this.

---

big daddies and free Esmerelda into the bargain.

Each stage encourages athletic rope work as you switch bell pulleys to access ledges. Hooks and moving platforms are auxiliary modes of transport, with the ever present threat of a mangling in the giant screws and cogs below. These are most realistically portrayed as is the bone crushing. In the first three screens I only encountered bats. There are two more stages plus the belfry where fireballs, arrows, cannonballs and axes are promised. Reach the finale, ring the bells and rescue 'er indoors.

Hunchback I was the game that put Ocean on the map a year ago. Now — whether it's Daley Thompson or Frankie Goes to Hollywood — there is an Ocean game to match.

---

Spiderman is the second in the Questprobe series. There will be 12 games in all.

Adventure expert Keith Campbell says that each of the Marvel games are linked — though in a way not immediately obvious to the player. "To tell you might spoil your enjoyment . . . suffice it to say that I was once again in awe of Scott's ability to create something exciting, original, and downright devious."

Scott is pretty impressed with the comic idea himself. "Adventure players are going to start reading comics again . . . it'll be more fun if you read the comics, but it will not be any easier," says Adams.

On the plus side the graphics are brilliant and lose nothing in the transition from comic book to computer screen. But it takes more than a pretty picture. Can't see this rivalling the rest of Scott's output. Check the Hulk if you want a real Marvel adventure.

---

# • SCREEN STAR •

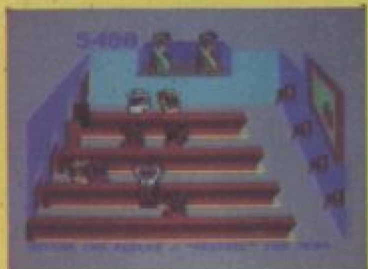


## Tapper
## Commodore 64
## U.S Gold
## Price £9.95 cass £12.95 disk



**Presentation:** ■■■■■
**Skill level:** ■■■■□
**Interest:** ■■■■■
**Value for money:** ■■■■□





If you've ever stood at a bar for what seemed like an eternity in pursuit of an alcoholic beverage or been rushed off your feet by thirsty punters serving on the other side, then this is the game for you.

Tapper casts you in the role of the frenzied bartender whose job it is to keep a never-ending stream of thirsty customers supplied with a never-ending stream of glasses of soda. We begin the tour of Sodaland in the Old West Saloon. The doors have just opened and the parched cowboys make their way to the bar. It's your job to quench their burning thirst.

The trouble with the crowd here is that they're not very polite. When they finish drinking there's no 'excuse me can I please have another when you're ready', they just sling the empty straight back at you. If you're not at the end of the bar to catch it — smash! And the boss doesn't like it when glasses get broken . . . You remember I said the customers were rude? Well, if one of them gets to the end of the bar before you've served them they'll pick you up by the scruff of the neck and sling you down the bar just like a soda!

If you prove a success in the Old West Saloon you get to move on to the 'Jock's Bar'. Jocks, we are told, are sports fans. These boys are pretty rough, they drink Green Chatreuse by the pint and woe betide anyone who gets in their way when Scotland get knocked out the World Cup or if they happen to see a Rapide Vienna fan.

En route to the Jock's Bar is the Bonus Round where you will meet the Soda Bandit. The Soda Bandit is a sort of Marty Feldman character with big bulbuous eyes and a black hat. He shakes up five cans of fizzy drink, and then switches them around. To get a bonus you have to pick the unshaken one. You get to play the Bonus Card every time a bar is successfully completed.

And so you go on your merry way. If you make the grade as a bartender at the Old West Saloon and the Jock's Bar you will get to work the Punk Rocker's Bar and the Space Bar. The graphics and music are excellent and varied, and the frantic nature of the game makes boredom a very remote possibility. But I'd better not keep you any longer — your customers are getting thirsty!

# Operation Salvage

## How to recover a corrupted or NEWed program

**by Frank Randall**

Your average creased and haggard programmer won't hesitate to tell you that not being able to recover a corrupted or accidentally NEWed program is a frustrating experience. To avert premature baldness, here's an easy step-by-step method of overcoming those problems — and it works for both the Vic and Commodore 64.

Anyone who has spent a great deal of time entering a program only to find it will not reload from tape knows how frustrating programming can be. There are many reasons for tape read failures. Often the program or part of it is in memory but is not accessible because the internal pointers have not been set up correctly by the loading action, or the pointers have been overwritten. They will neither LIST nor RUN. But with a little patience and some fiddling, recovery of either the whole program or part of it is often possible.

Here's a description of the steps to take. The procedure is in the form of a series of Basic commands entered in direct mode. That means you don't need to type line numbers. How it works is explained later. For now, all you need know is that it works equally well on Vic 20s and Commodore 64s.

### How it's done

We start by typing in these three lines.

Step 1 — Type **POKE 45, 200 : POKE 46, PEEK (56) − 1 : CLR** and Press Return

Step 2 — Type **A = PEEK(43) + PEEK (44)*256** and Press Return

Step 3 — Type **FORJ = 1 TO 10000 : PRINTPEEK (A + 2) + PEEK (A + 3)*256; A:A = PEEK(A) + PEEK(A + 1)*256 : NEXT** and Press Return

This will produce a list of pairs of numbers that scroll up on the left side of your screen. Holding down the Control key slows down the display. On each line the first number is the Basic line number, and the second is the address of that line. Watch for an odd looking line number; that is, one that is out of ascending sequence, followed by a line with a zero address. Then press the Runstop key. A simple example of the display would look like this:

```
10 4097
20 4176
30 4205
40 4268
1307 4301
26 0
7096 37168

BREAK
```

Take the address prior to the zero (in the example, it's 4301), add 2 to it and call the result **x**. Then you need to enter some more commands:

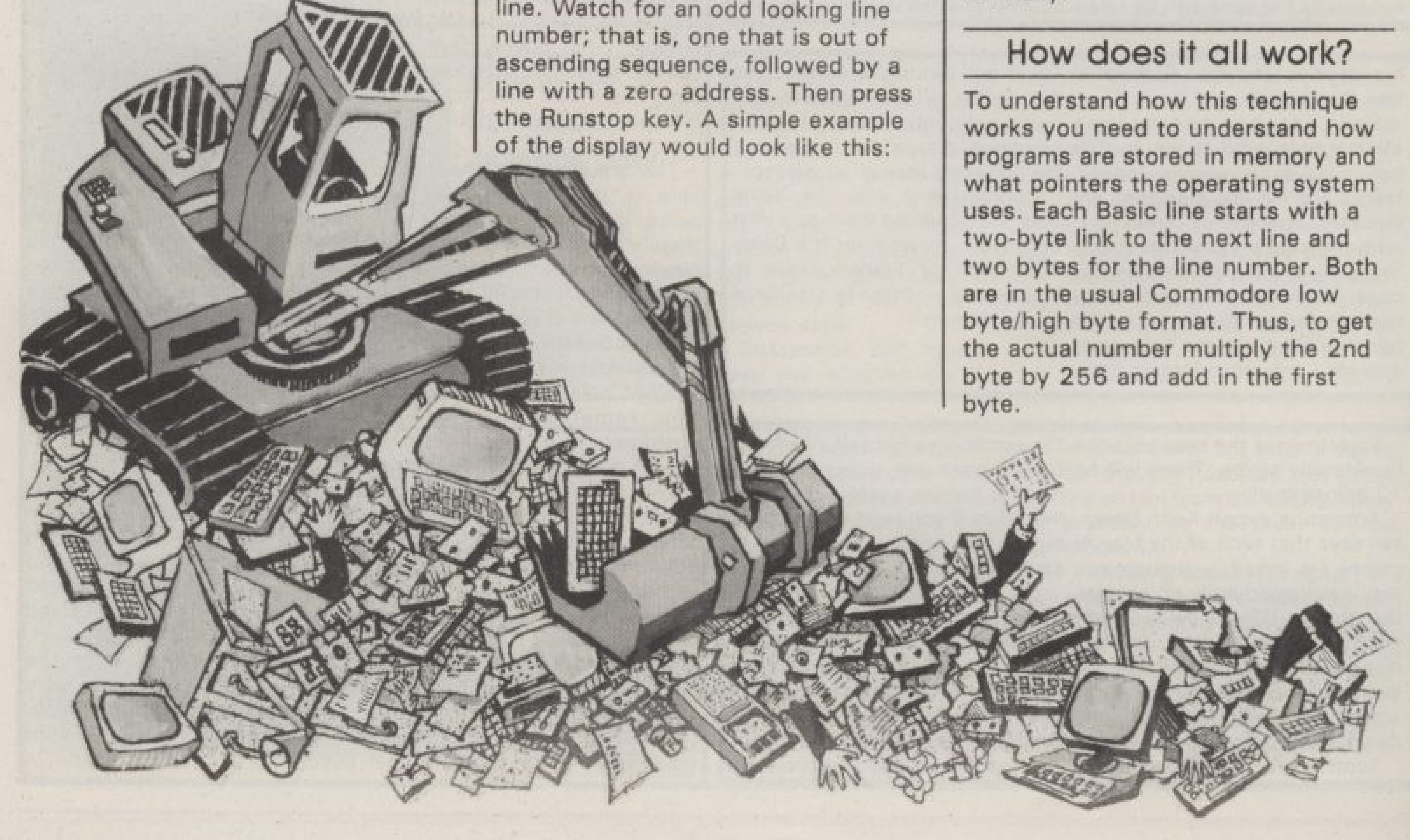
Step 4 — Type **A =** and the number called **x**. Press Return

Step 5 — Type **POKE45, A − (INT (A/256)*256):POKE 46,A/256:CLR** and Press Return

The program should now list and run normally.

### How does it all work?

To understand how this technique works you need to understand how programs are stored in memory and what pointers the operating system uses. Each Basic line starts with a two-byte link to the next line and two bytes for the line number. Both are in the usual Commodore low byte/high byte format. Thus, to get the actual number multiply the 2nd byte by 256 and add in the first byte.



Various pointers are used by the operating system, but those used in the procedures described in this article are:

- Start of Basic — locations 43 and 44
- Start of variables — locations 45 and 46
- End of available memory — locations 55 and 56

Provided these are set correctly, the others are set automatically by the CLR command.

The object of typing **Step 1** is to set the end of Basic pointer to an artificially high value so that when the later commands create variables they do not overwrite the program to be restored. **Step 2** initialises variable A to point to the first Basic line, and **Step 3** is the loop which converts the line number, prints it and the address in A, and sets A from the link address in that line. Basic programs end with a link address of zero, hence the need to add 2 to the address of that line before typing **Step 4**. **Step 5** formats the adjusted address to low/high and sets the pointer in locations 45 and 46 ready for the CLR.

## Salvaging a corrupted program

If the end of a program has been overwritten such that the zero link address is missing, an extra bit of work between **Steps 3** and **4** will salvage most of the program. It is important to avoid listing the program if this is suspected as this may result in the system crashing.

Go through the procedures outlined above up to and including **Step 3** and watch out for an out of sequence line number which is where the corruption starts. Subtract 1 from the address of that line, call it **x**, and then:

Step 6 — Type **POKEx,0 : POKEx + 1,0 : POKEx + 2,0** and press Return

Remember to type the value of **x**, not the character 'x'. Add 3 to **x** and then continue with **Steps 4** and **5** as described above. Part of the last line of the program salvaged in this way may be rubbish but it can be edited or replaced in the usual way.

## Recovering from NEW

Another use for this technique is where the initial link has been destroyed by typing NEW. To recover the program in memory, type **Steps 1** and **2** and then:

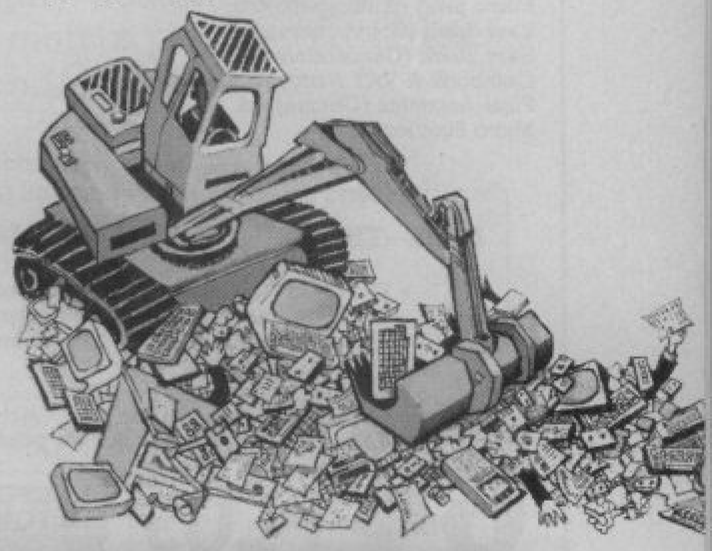
Step 7 — Type **FOR J = ATOA + 255 : PRINTJ ; PEEK(J) : FORJ1 = 1TO100 : NEXTJ1,J** and press Return

Ignore the first four bytes, watch for a zero byte and then press the Runstop key. Call the address after the zero byte **x**, type the command at **Step 2** again and then:

Step 8 — Type **POKEA,x – (INT (x/256)*256): POKEA + 1,x/256** (remember to use the value for x) and press Return

The missing link address will have been restored but **Steps 3** to **5** must be taken to restore the other pointers and the job is complete.

**A few minutes spent fiddling in this way could save hours of retyping. Happy recoveries.**



# PLUGGING INTO EPSON

## The Comprint Epson/Centronics interface reviewed

### by Chris Durham

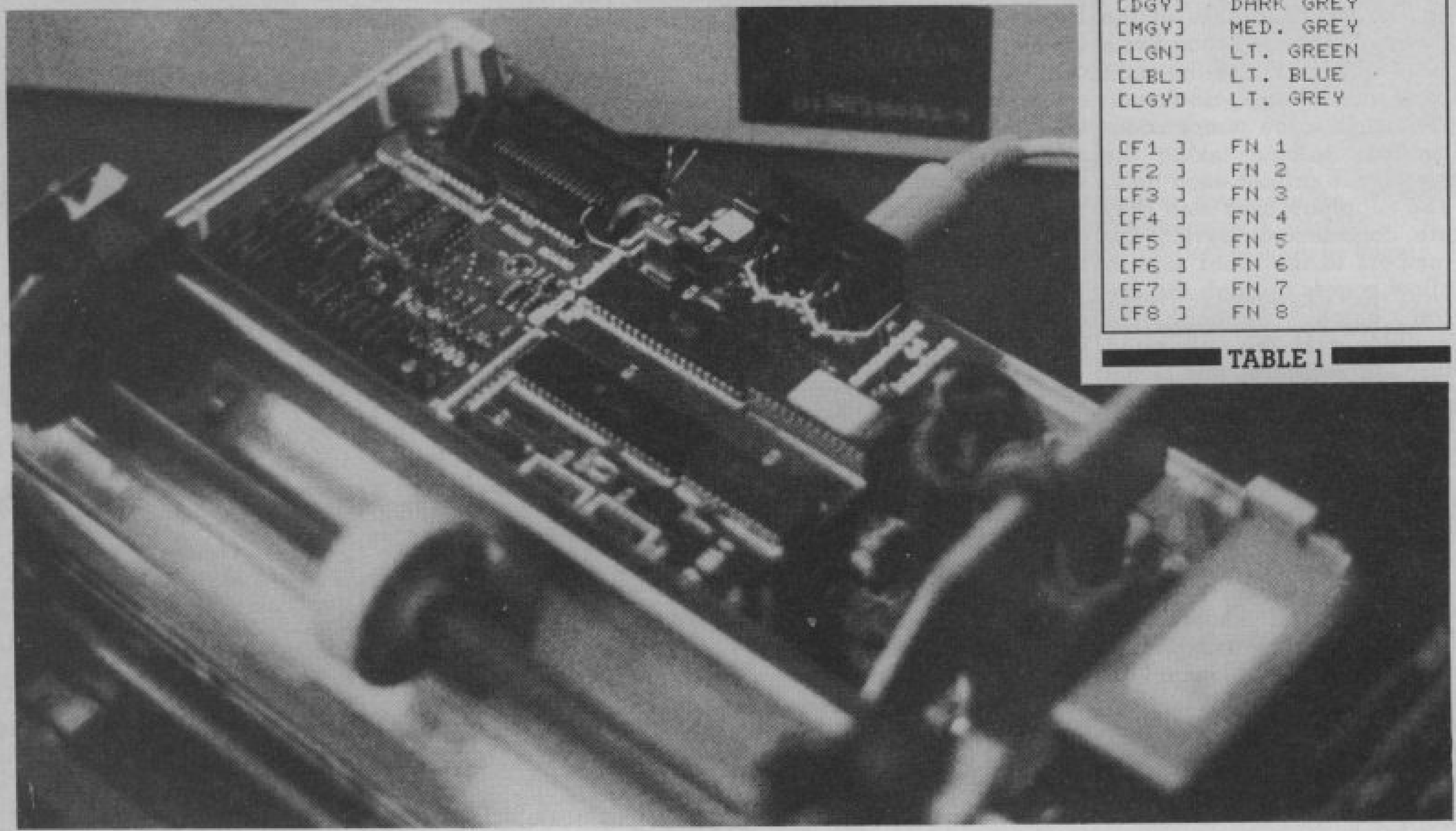
Commodore users have always mourned the fact that only a Commodore printer will plug straight into their computer. Using a non-Commodore model means buying an interface adaptor. But which do you choose? It might be easier if there was a special interface available for the printer you want to buy. Like the Comprint interface from Micro Control Systems, especially designed for a Commodore 64 and an Epson or Epson-compatible dot matrix printer. At £61.99 it's not cheap but it allows you to use that coveted Epson. Chris Durham plugged in and used it to write this report.

Interfaces for non-Commodore printers have been around for almost as long as the computers they work with; for the simple reason that Commodore home computers use a non-standard method of serial communication for their printers. The common standard for most cheap printers is Centronics parallel, with RS232 serial coming a more expensive second. While the new Commodore printers are catching up on the quality and value for money at the lower end of the market, there's always been a demand for interfaces that would allow 'near letter quality' (NLQ) dot-matrix printers such as the Epson to be attached to the Commodore home computers, particularly for use with wordprocessing programs.

The early devices merely did the character conversion necessary, without allowing the user to print the Commodore character set. Later models actually allowed the Commodore character set to be printed, including the 'reversed graphics' that represented the control codes. Now, we have interfaces that not only do all this, but convert the control codes into readable strings, make the printer act either like itself or as a Commodore printer and even allow you to preset 'format strings' which determine how lines are printed. Such a beast is the **Comprint** interface from Micro Control Systems.

### Comprint — the hardware

It is designed to fit inside an Epson (or compatible) printer, with just a single Commodore DIN-plug lead connecting it to the computer; in other words exactly the same as a Commodore printer. Not only that, but it has **two** serial port sockets, enabling you to connect a second printer/plotter without



```
[WHT]   WHITE
[RED]   RED
[CYN]   CYAN
[PUR]   PURPLE
[GRN]   GREEN
[BLU]   BLUE
[YEL]   YELLOW
[RVS]   REVERSE ON
[RVO]   REVERSE OFF
[HOM]   HOME
[CLR]   CLEAR
[INS]   INSERT
[CUD]   CURSOR DOWN
[CUP]   CURSOR UP
[CUR]   CURSOR RIGHT
[CUL]   CURSOR LEFT
[CUL7]  MULTIPLE CODES
> <ONE SPACE
>     <FIVE SPACES
>[SPC6]<SIX SPACES
>[SPC10]<TEN SPACES
[ORG]   ORANGE
[BRN]   BROWN
[LRD]   LT.RED
[DGY]   DARK GREY
[MGY]   MED. GREY
[LGN]   LT. GREEN
[LBL]   LT. BLUE
[LGY]   LT. GREY

[F1 ]   FN 1
[F2 ]   FN 2
[F3 ]   FN 3
[F4 ]   FN 4
[F5 ]   FN 5
[F6 ]   FN 6
[F7 ]   FN 7
[F8 ]   FN 8
```

**TABLE 1**

# PLUGGING INTO EPSON

difficulty (even Commodore themselves don't do that). Fitting the board inside the printer means that you have to remove the top as the board must be screwed into the slot provided. This is not a difficult operation, provided you follow the instructions.

The only slight problem with fitting the board inside the printer is that this is where many of the print buffers fit as well; so if you already have a printer buffer, whether internal or external, you won't be able to use it with Comprint. I understand that Micro Control Systems intend to produce a version which includes its own buffer (up to 32K), which should help solve the problem. The existing board already includes a 2K print buffer, emulating the one on the *Epson FX-80*. This is good news for those of you with the *RX-80* or the earlier MX series, since this means that you can now get downloadable characters as well. Since you already get the Commodore character set in full you can use this facility for all sorts of other characters.

On the Comprint board itself are three 'jumper' plugs, which determine which mode the board is in when it powers up. Unfortunately these are on the left-hand side of the board. Since the Epson has a removable cover on the right hand side of the printer you cannot alter the jumper connections without taking the top off the printer each time. The suppliers have said they are considering moving the jumpers to the other side to allow access through the Epson 'hatch'. Although the modes can be changed through software, this is not possible if you use a cartridge-based word-processor so it is worth making sure you set the board up in the straight-through mode from the start. This allows printer control codes etc, to be passed without getting converted. The other modes are to allow different Epsons to emulate the corresponding Commodore printers; eg mode 2 is for the *MX-100*, *RX-100* and *FX-100* and allows the full width of the paper to be used.

## Hardware hiccups

As with all non-Commodore products, there always tends to be a little unforeseen hitch and Comprint is no exception. You cannot have the interface connected unless *all* the devices on the serial bus are switched on. This may seem a small point, and will probably not affect many people, but if I am doing a quick test of something on the computer I don't always bother to switch on the disk drive if I don't need it. Under these conditions, with Comprint connected, the computer will not power up correctly; switching the disk drive on *after* the computer causes a reset, ignoring any cartridges that are connected.

Thus if you want to run a cartridge program or a game, either unplug the printer connection or ensure everything else is switched on first. However, it is not even this simple, because if you switch off your printer (to set the 'top of page' for example) and then turn it back on again it also causes the computer to reset — losing all the text in your WP unless you had already saved it. I know, because it happened to me. This is potentially more serious and needs looking at by the manufacturers.

## The software

The great advantage of this sort of interface is that there is no software to load or run before you can use the printer; it is all contained in a ROM on the board itself. The interface is in reality a self-contained, dedicated computer with its own 6502 processor, enabling it to do all the fancy things that it does. The ROM contains the control program for the whole process. This means that when the manufacturers come up with a new idea they only have to change the ROM and you have instant new facilities. This was graphically illustrated when I received a new ROM halfway through the review which added the facility to print out the control codes in listings, an option previously lacking on Comprint.

The facilities are all controlled by 'secondary addressing'. Those of you who have used Commodore printers will know that this is a way of sending additional information to the printer when you open a print channel; for example **OPEN4,4,7** opens a Commodore printer in lower case mode, where '7' is the 'secondary address'.

**TABLE 2**

| | |
|---|---|
| 0 | — Print data as received (default option) |
| 1 | — Print data according to a previously defined format |
| 2 | — Send format string |
| 3 | — Set number of lines per page |
| 4 | — Enable diagnostics |
| 5 | — Define programmable character |
| 6 | — Set spacing between lines |
| 7 | — Set default character set to lower case |
| 8 | — NOT USED |
| 9 | — Suppress diagnostics |
| 10 | — Reset printer |
| 11 | — Change printer type (change mode) |
| 12 | — Enable control code conversion |
| 13 | — Disable control code conversion |

Comprint uses a similar syntax, but unfortunately the method is not always the same. Under normal circumstances you would continue printing on the channel that you opened until you had finished, but Comprint is different in that some 'channels' are for commands only; you can't send any text on them.

Thus **OPEN12,4,12: PRINT#12: CLOSE12** sets the 'control code conversion' mode; you still have to send the listing on logical channel 4, for example, **OPEN4,4: CMD4: LIST**. *Table 1* shows the control code conversions (just what you need for Victuals). *Table 2* shows all the facilities available on the secondary addresses. There is even an option (4) which will tell you what the errors are if you make a mistake in the other commands — very clever!

The format control is worthy of mention. This allows you to preset the form that a printed line will take, both numeric and textual. It can be used to set up columns of figures, truncate strings to the same size, format a date correctly or even produce leading and trailing zeros in a number. Characters can be included in the format that are added to the text received from the computer — all in all, very impressive.

## The instructions

With such a wide range of commands it is vital that the instructions allow the user to get maximum benefit from the interface. While some of the facilities were clearly explained, others were passed over with little explanation and no examples. The new commands, using secondary addresses 12 and 13, were on an Addendum sheet that was very unclear. However, I am assured that the new instruction book will be much clearer and will include more examples. The only way to really get to know what this beast will do is to try out all the examples and options. It won't be a quick trial, there's far too much to learn, but once you have mastered the facilities, there seems little you won't be able to do.

## Conclusions

This is one of the most versatile printer interfaces I have used. It offers a wide range of facilities which include printing the full Commodore graphics set, converting the control codes to meaningful strings and being able to format the printed output as you wish.

**With your Commodore computer, your Epson printer and Comprint you will have a combination that will do almost anything you ask of it. For those who do not own an Epson, Micro Control hope to market versions for other printers too. At £61.99, I consider it good value for money. My one proviso is that the problem of resetting the computer when anything on the serial bus is turned on needs looking at.**

Micro Control Systems
1 Cherrywood Drive,
Aspley,
Nottingham NG8 3NN
0773 769011

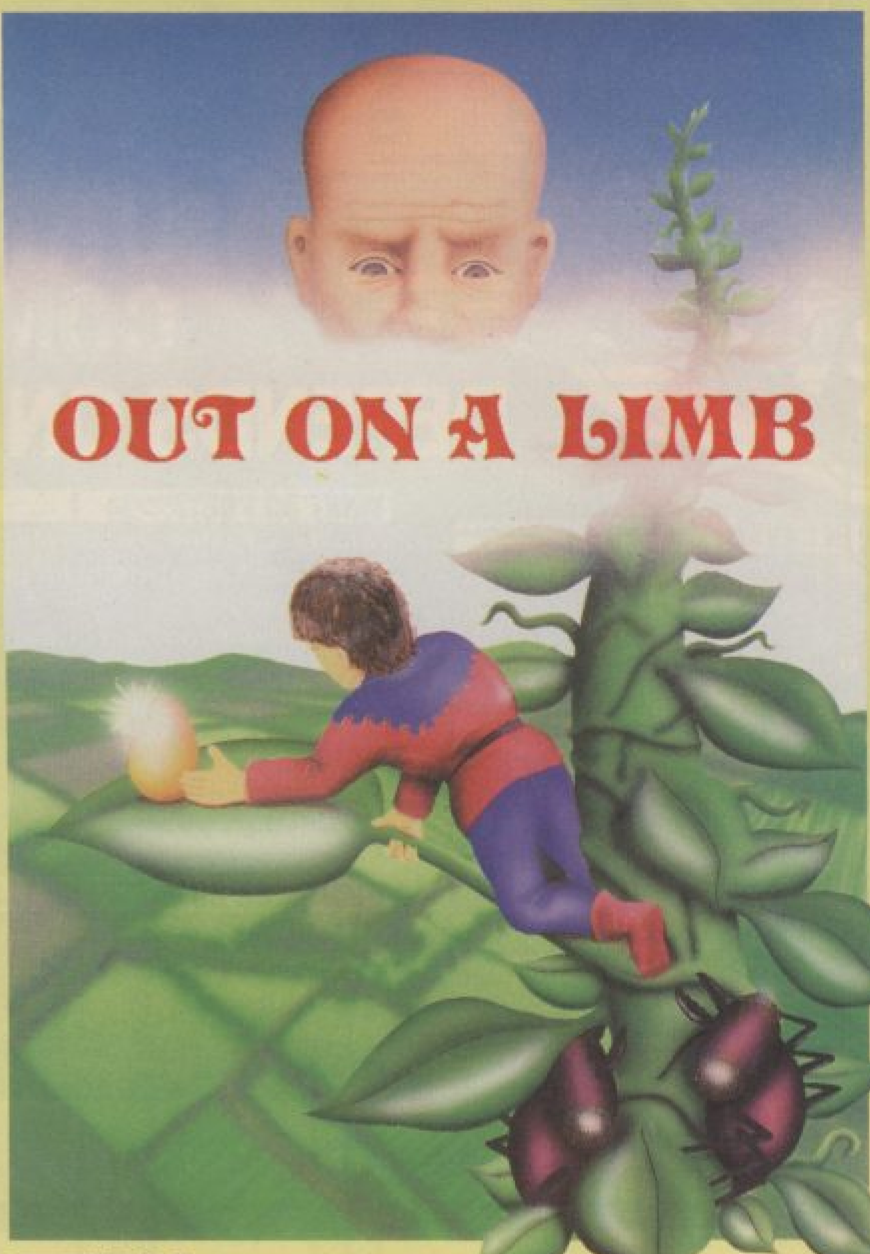
Comprint CMB/Epson printer interface

£61.99 (incl VAT)

# COMMODORE C16 AND PLUS 4

LAS VEGAS

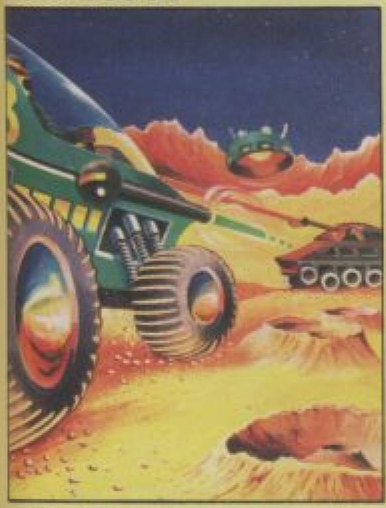





ZODIAC



MOON BUGGY



3D TIME TREK



FLIGHT PATH



SKRAMBLE



**TURBO FAST LOADER**

**LAS VEGAS** Las Vegas brings all the challenges of a deluxe arcade fruit machine direct to your fingertips. Many exciting features include, gamble, cancel, collect, nudge and number options, with a three row display and maximum payout of 20$.
*K.B. Only C.16 £6.95*

**ZODIAC** This is an enthralling arcade adventure in which the evil powers of hell have scattered the signs of the Zodiac in the four hundred chambers of the abyss. Struggle to collect these signs and at the same time try to annihilate everything in your way. How long can you stay alive?
*J.S. or K.B. C.16 £6.95*

**PETCH** Race Petch around the screen, moving ice blocks to alter the maze, however, beware of the nasty monsters who are constantly chasing Petch as you attempt to collect the bonus cherries. Also if you can touch the edge of the maze the monsters will suddenly burst into flames, but look out they'll soon be back!
*J.S. or K.B. C.16 £6.95*

**MOON BUGGY** You must skillfully manoeuvre your jumping patrol vehicle over dangerous moon craters as well as large boulders and cunningly placed mines. Not only this but avoid the hovering alien spaceship as it bombards you from above.
*J.S. or K.B. C.16 £6.95*

**3D TIME TREK** As sole survivor of the planet "Corillian" your quest is one of anger and revenge. The starship you are flying is full of the latest inboard computers and extra powerful sensors. Also included are full 3D graphics, to add unbelievable realism to this fantastic journey through time itself, and beyond.
*J.S. and K.B. C.16 £6.95*

**SKRAMBLE** Earth has been overrun by the Cobrons and its up to you to battle through the six ferocious and testing sectors. Adversaries include meteors, UFO's and deadly fireballs. Fly through an armoured city, then an elaborate maze and finally the command base itself.
*J.S. or K.B. C.16 £6.95*

**FLIGHT PATH** Flight Path is without doubt the best flight simulator on the C/16 and Amstrad. The many elaborate features include; Altometer, flaps, directional headings, crosswinds, fires, ground warning lights and reverse thrust to name but a few. Also included are smooth graphics as you take off, cruise over mountains, and land once again.
*J.S. and K.B. C.16 £6.95*

**OUT ON A LIMB** This is a fantastic and in parts outrageously funny game. Based on the fairytale of Jack and the Beanstalk, Out On A Limb is full of the most strange and eccentric characters you are ever likely to meet. Firstly, climb the stalk and jump onto the clouds, then enter the giant's castle searching for treasures. However, watch out for vacuum cleaners, musical notes, televisions and potted plants, all of which chase you round the many and elaborate rooms of the castle. Once the treasure is collected the single exit will be opened, and then..........?
*J.S. or K.B. C.16 £6.95*

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# Part 1 — taking the first steps

## by Brian Grainger

*Did you get a new Commodore computer for Christmas? Have you owned a computer for some time but use it only for playing games? Maybe you think it's time you started programming? This is the start of a four-part Basic tutorial for the absolute beginner, taking you gently through the basics of Basic. This month Brian Grainger shows you how to write a simple program to produce a message on the screen and some graphics. So let's get going . . .*

Remember the day you opened the box of your brand new Commodore computer? You plugged it all together with your TV and turned it on. The first thing you probably did was to load a program from the cassette given or bought with the machine and ran it. This is the first time you have used a computer program.

It may have been the latest game, a drawing program or something educational. Whatever it was, each of these different programs gets the computer to work in a different way. It is this that makes a computer such a useful thing.

In the past you bought a game, like Monopoly, played it a while, got tired of it and shoved it in the cupboard. There may be a typewriter in your home for writing letters but it does nothing else but write letters. Your computer can do all these things. It's the program which allows you to choose what it does.

The purpose of this series is to teach you how to write your own programs and get your computer doing what you want, so it will never join the Monopoly in the cupboard.



*"write your own programs and get your computer doing what you want"*

### What is a program?

What is a program? Let's consider a simple everyday function like watching the telly. You may not realise it but you're probably going through the following steps to do this simple task:

- look at the paper to see what's worth watching, and make a choice
- turn the television on
- select the right channel
- if the volume is too loud or too soft then change it
- watch the programme
- keep watching the programme until it is finished, or it's time for Dallas
- if you want to watch something else then go back to selecting the channel
- if you do not want to watch anything else then switch the television off.

The above is a set of instructions to tell you how to watch the television. I could just as easily have given another set of instructions to tell you how to get up out of bed and prepare yourself for school or work. In other words, you're following different sets of instructions for different tasks. Just like the computer.

A computer program is simply a set of instructions to tell the computer how to do a particular task. Like the example above, the instructions are performed in sequence

unless the result of answering a question, for example, means that we must jump to another point in the sequence.

## The Basic language

Let's consider another point. If I gave the above instructions to a French person and told him to carry them out, he probably wouldn't know what to do because he did not understand English. So for him to understand I would have to write the instructions in French, *a different language*.

The same applies with computer programs. The instructions have to be written in a language the computer understands. When you turn on your Commodore computer the language it understands is called BASIC.

There is another point in common between the languages understood by people and those understood by computers. People from, say, London will speak the same English as people from Newcastle. But one will sometimes use 'slang' or dialect words that the other won't understand. The problem is that although the language is the same, the dialects are different! The same thing happens with Commodore computers. Although they all understand BASIC, there is a different dialect used by the Commodore 16 to that used by the Commodore 64. Certain words in Commodore 16 BASIC, such as HELP or PAINT, will not be understood by the Commodore 64. Throughout this series we shall only use the 'words' understood by all Commodore computers.

The person who writes the program of instructions which the computer will understand and act upon is the programmer. Let's set about the task of writing programs so that you become a programmer straight away.

## Programming starts here

Here is a simple one line program. Type it into your computer carefully. If you make a mistake use the 'DEL' key to delete what you typed and then type the correct letter.

**PRINT "I AM A COMMODORE COMPUTER"**

When you are sure it is right press the 'RETURN' key. All lines of program are sent to the computer only when the 'RETURN' key is pressed. I won't mention this point every time. Just remember to press the 'RETURN' key after every line. You should see the following displayed on the screen.

**I AM A COMMODORE COMPUTER**

**READY**

We can see that the computer has done what the line of program said. It has printed the words inside speech marks on to the screen. Having completed the program it then says READY to tell you that it is ready for your next instruction.

## Now for a real program

Let's suppose we want to print on the screen the following:

**HELLO**
**I AM A COMMODORE COMPUTER**

But hold it, we could NOT type the following lines from the keyboard:

**PRINT "HELLO"**
**PRINT "I AM A COMMODORE COMPUTER"**

Try it and you can see why not. Each time the RETURN key is pressed the computer prints the words and then says READY. But we don't want READY to get between the two lines. We want the computer to remember the instructions that it is given and only carry them out when we tell it to. We need a way of storing the instructions without being obeyed and we do that by giving each instruction a line number, like this:

**10 PRINT "HELLO"**
**20 PRINT "I AM A COMMODORE COMPUTER"**

When the line is sent to the computer this time nothing happens. The flashing cursor comes back for you to type the next line. But the computer has remembered the lines, as you can see if you type LIST. That's another command you've learned, it lists all the lines of a Basic program you have stored in memory.

Here's another command: when we want the computer to obey the instructions that it has remembered, or stored in its memory to give the technical term, we tell the computer to run the program. Just type RUN. That makes the computer carry out the instructions in the order given by the line numbers, starting with the lowest. In this case it will obey line 10 and then line 20 so we will get:

**HELLO**
**I AM A COMMODORE COMPUTER**

You may be wondering why I chose the numbers 10 and 20, rather than 1 and 2. Suppose we had written the above program and then we decided we wanted the computer to appear friendly. Suppose we want to ask for the name of the person who runs the program, BRIAN say, and then print HELLO BRIAN.

## The INPUT command

First we want an instruction to ask the user to input his or her name and we want to do this *before* we print HELLO. By adding the following program line we can do this:

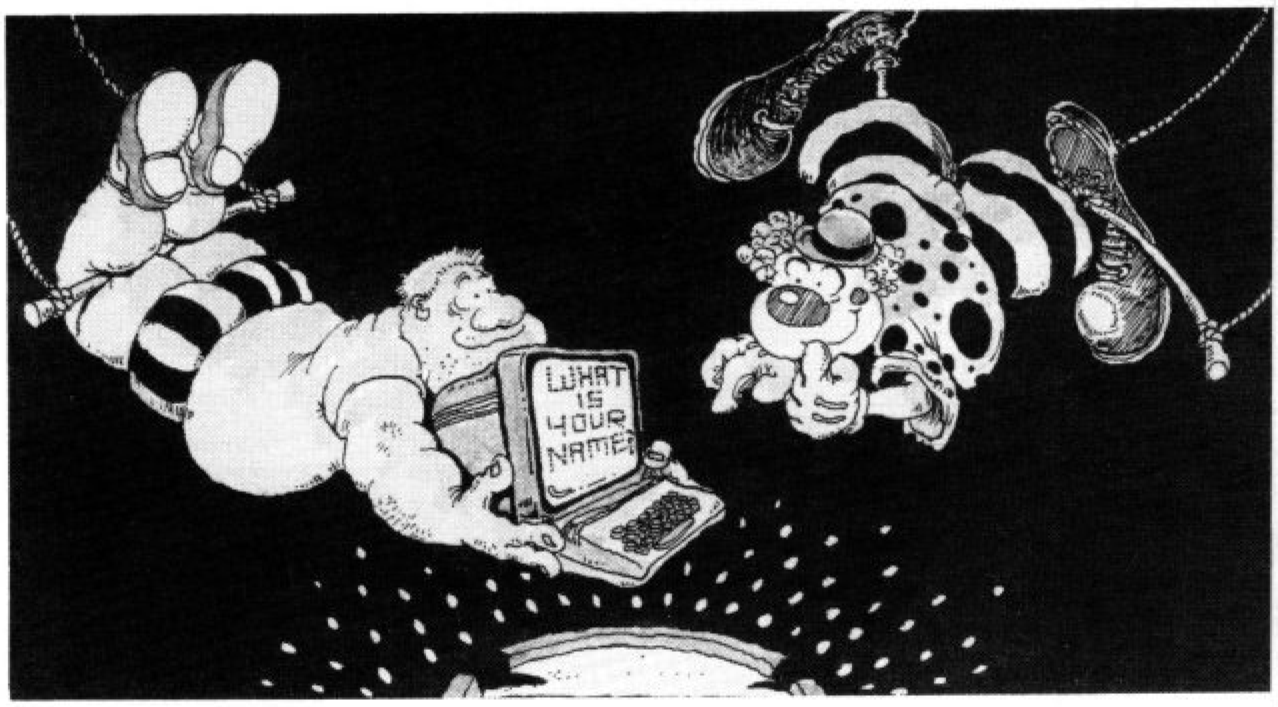
**5 INPUT "WHAT IS YOUR NAME";NA$**

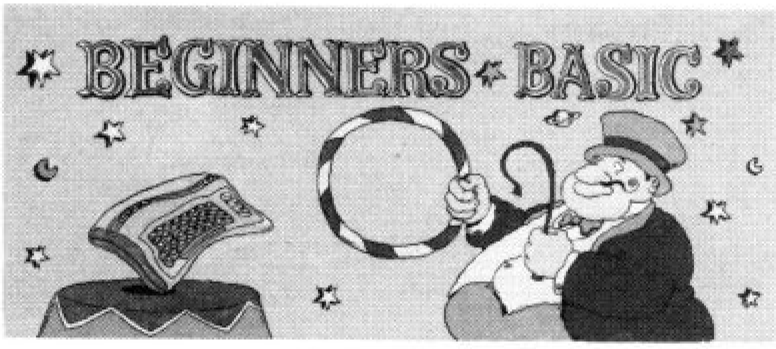
When this instruction is obeyed the computer will print on the screen the message 'WHAT IS YOUR NAME?' and the flashing cursor will wait for you to type it in. When you have typed it in (and pressed RETURN) the computer will store it in a 'box' which the computer has labelled **NA$**. It does this so we can refer to the contents of the 'box' at any time.

Because we have given the new line a number 5 it will be obeyed before line number 10 which is what we want. If the first line of the original program had been 1 we would not have been able to choose a lower number of the new line.

Now what we need to do is to revise the program so that the computer will print the

*"First we want an instruction to ask the user to input his or her name . . ."*






name given after the word HELLO. First of all change line 10 as follows:

**10 PRINT "HELLO";**

You can do this by typing **LIST 10**, and then moving the cursor with the keys marked 'CRSR' to the point at where a change is required. Then overtype with the change. Press RETURN when the line is right and the line stored in memory is changed as well.

**COMPUTER"**

Type RUN and see for yourself that the program does what we want.

## A graphic program

In all the examples above we have just printed words on to the screen. But we can also print the graphic characters displayed on the front of the Commodore keys. We can quote marks.

You will find that special symbols are displayed on the screen when you do this to show that the appropriate key is pressed. Some special symbols are visual representations of the control code being printed. These visual characters are usually reverse field graphic characters such as reverse field 'heart' for <CLR> — ♥. Just about any Commodore key except 'DEL' can be printed.

Below is an example of a program that will print a red square in the middle of the screen. Use the panel to find out how you get the various graphic characters:

## LOAD and SAVE

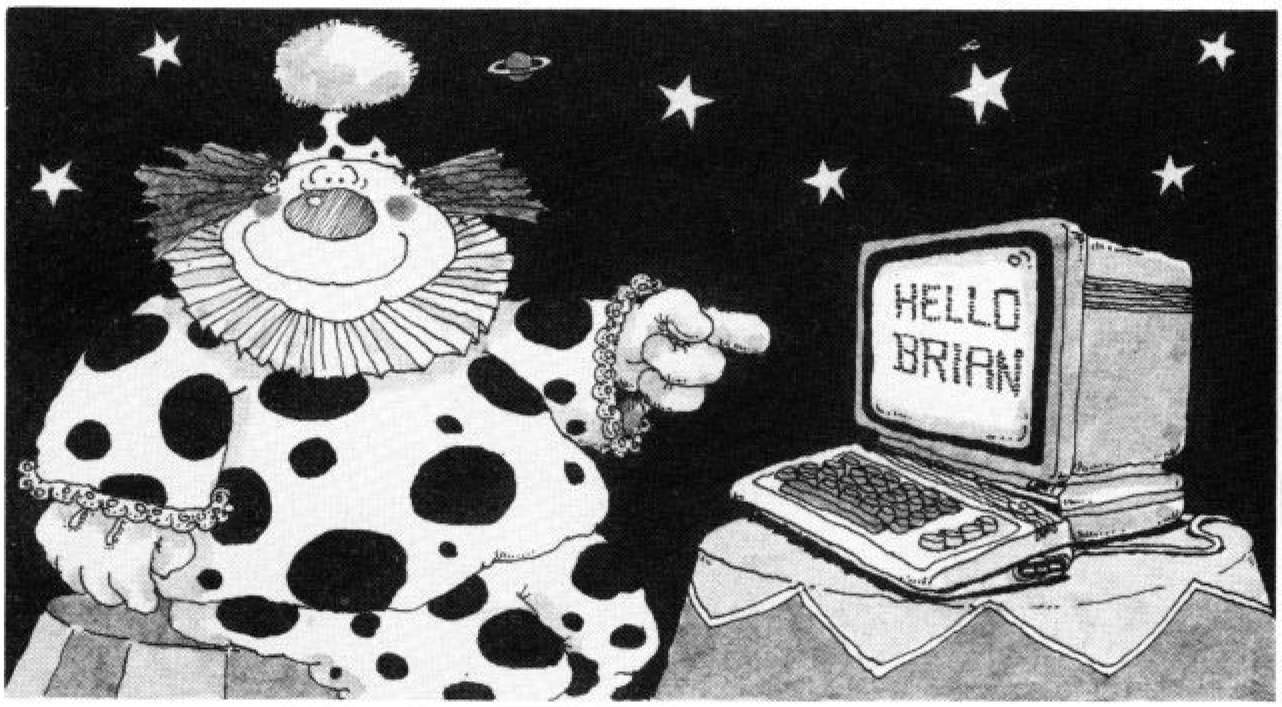
There is one very important point about programs. Once they have been stored in memory they only stay there as long as the machine is switched on. We must have a means of storing them somewhere else when you turn the machine off.

If you want to store the program that is in memory onto cassette simply type: **SAVE "PROGRAM NAME"**. The words in quotes can be anything so long as they contain no more than 16 characters. They are used to identify different programs stored on the same tape or disk.

To save a program on the 1541 disk drive, we type instead: **SAVE "PROGRAM NAME",8**.

Having stored the program on cassette or disk we can now safely turn the computer

*"revise the program so that the computer will print the name given after the word HELLO"*




With line 10 in the original program the next line (I AM A COMMODORE COMPUTER) was printed on the next line. Because we have added a ';' at the end of the line the next item to be printed will be printed, not on the next line, but immediately following the text we have just printed.

Finally we add a new line:

**15 PRINT NA$**

This will print the contents of the 'box' labelled **NA$**. We know this contains the name of the user.

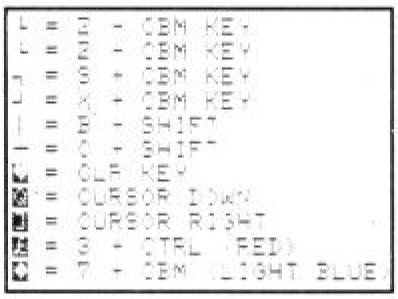
By giving the line a number 15 it will be obeyed after line 10 but before line 20. We have *inserted* a new line in the program.

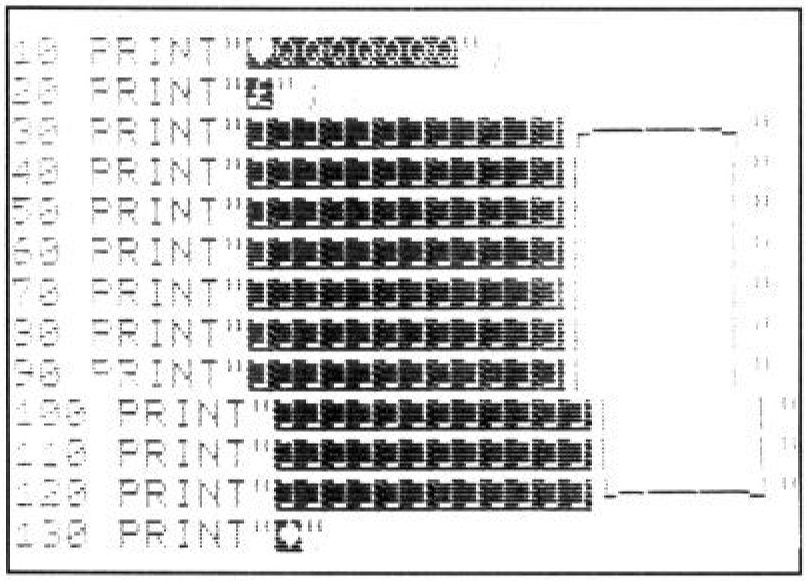
We now have the full program as follows:

```
5 INPUT "WHAT IS YOUR
   NAME";NA$
10 PRINT "HELLO";
15 PRINT NA$
20 PRINT "I AM A
   COMMODORE
```

change the colour of the text or graphics or move the cursor around the screen as well.

To do this is simple. Just press the appropriate key with SHIFT (for the left side character) or the COMMODORE KEY (for the right side character) within the




off. Next day when you want to get your program back into the computer you load it into the computer from cassette by: **LOAD "PROGRAM NAME"**, or from disk by: **LOAD "PROGRAM NAME",8**.

There is another way of removing a program from store without turning the machine off. Simply type **NEW**. When you do this you can then start a new program on what is effectively a clean computer store.

**Now is the time to test whether you have understood everything so far. Before next time have a go at trying to write a program which asks for the user's name and then prints both a smiling face and a welcoming message. Phew, time to take a breather — see you next month.**

# The Forth Dimension: Programming with a DIY Language

## Part five — take a piece of string . . .

### by Richard G Hunt

Handling numbers is important. The only aspect not so far covered in this series is input via the keyboard. This and string handling (including the input counterpart) is the subject of this article.

String handling is a little tenuous in Forth. Some would say non-existant. This does not mean that Forth is defective, merely that, for example, string variables as in Basic are not required. Forth relies on the ASCII table, which of course is numeric. So to output a character string the word **EMIT** is used which requires the appropriate ASCII value as a parameter on the stack:

**>89 EMIT < Y OK**

(Remember **DUMP** which had the word ASCII defined using **EMIT** in a loop?)

Programmed text may be output using [."] (dot quote):

**>." Here is some text" <RETURN> HERE IS SOME TEXT OK**

The final quote mark is not a Forth word but a delimiter to the text. Note also the mandatory space between [."] and the text.

With both **EMIT** and [."] most string output routines can be handled. Input is a little different. The building blocks exist in Forth but there is usually no pre-defined word to get input from the keyboard. So we must define a word like **INPUT$** ourselves. Fortunately this has been done before and as I decline to re-invent the wheel, or **INPUT$** I have drawn on several sources to provide this working definition, and it seems to me a reasonable consensus:

```
VARIABLE  STR$ 78  ALLOT

: INPUT$  STR$ 80 32 FILL ." >"
          QUERY 1 WORD HERE COUNT
          STR$ SWAP CMOVE ;
```

There are lots of new words and quite a lot else to explain here. First I should stress that this definition uses FIG-Forth, and that other implementations, even perhaps of FIG-Forth, may differ in some detail. Do check your system documentation regarding **WORD**. On Forth-79 the variable expression may be exchanged for **>CREATE STR$ 80 ALLOT<** which has a similar effect. The definition of **VARIABLE** does indeed use **CREATE** to allocate dictionary space for the entry to follow, which consists of a cell (two bytes). **ALLOT** turns **STR$** into an array of the specified number of bytes (here 80 in all as **VARIABLE** already has allotted two bytes). **CREATE** requires the full number of bytes to be allotted. So far then, we have made a space in the dictionary for an array of 80 bytes, which should be long enough for most purposes.

Next **FILL** ensures that the array is cleared by filling it with blanks (ASCII 32) — **STR$** leaves its address on the stack which followed by the count and character code is acted on by **FILL**. A prompt (>) is displayed. **QUERY** accepts a line of input up to the end of the line or a carriage return, and places the string in a temporary area whose address is indicated by **WORD HERE**.

The number 1 is a "null" delimiter required by **WORD**. It may be changed to 32, say, which will cut the string off at the first space. **COUNT** organises the address of **STR$** on the stack and finally **CMOVE** removes it character by character to the address (and reserved area) left by **STR$$**. This part is necessary because **HERE** changes all the time and without moving the string to a safeplace it would be corrupted.

#### Stringing out

Having input the string we need to output it again — like this:

**: OUTPUT$ STR$ 80 – TRAILING TYPE ;**

**[–TRAILING]** causes trailing spaces to be omitted from the string output by **TYPE**. If you are in any doubt as to whether **INPUT$** works use **DUMP** to examine **STR$** in memory. First input a string to **INPUT$**, then enter: **>STR$ 'U.**<.

The system will indicate an address, for example, **7101 OK**. Now enter, say: **>7090 7130 DUMP**< and the ASCII display will show the individual letters of the string following the Name Field Parameter (NFP) of **STR$**.

**KEY** is most often used to get a single character from the keyboard. For example the common Basic routine:

**500 GET A$: IF A$ = " " THEN 500**
**510 IF A$ = "Y" THEN . . .**

becomes in Forth

**: GETA$ BEGIN KEY 89 = UNTIL ;**

which suspends execution until the key with ASCII value 89 is depressed. Obviously any value may be substituted, my favourite being 32 (space). A page routine may look like this:

**: GET$ . "Press SPACE to continue" BEGIN KEY 32 = UNTIL 147 EMIT;**

So much for strings. You cannot imagine how they tied me up in knots.

#### Numeric input

Numeric input requires the definition of a special word like **INPUT$**. Some systems may support a word like **#IN**, otherwise you can define it in much the same way as for string input:

**: INPUT 0 0 CR . ">" QUERY 1 WORD (NUMBER) DROP DROP ;**

**INPUT** uses **(NUMBER)** or **CONVERT** on some systems to ensure that a number is left on the stack. The rest of it is as before except that it is not necessary to move the input as the stack is as safe as anywhere.

Input of a number is often associated with choice within a legal range of numbers. Forth makes this easy with **MAX** and **MIN** both of which require on the stack the number to be checked (n1) and the legal limit (n2). **MAX** returns the greater and **MIN** the lesser, so in backwards Forth style the upper limit is checked against MIN. For example:

**: LEVEL INPUT 10 MIN 1 MAX ;**

which allows input of any number but will pass on for further processing only a number between 1 and 10.

**Now for a simple exercise. Last year one of my daughters was having trouble with multiplication tables. I thought to try to help by writing a Forth word** TABLE **that performs the following procedures:**

- **defines and resets a variable** CHOICE
- **gets input of a number and stores it in** CHOICE
- **clears the screen, prompts for input and displays the "n times table" formatted neatly in columns (using 'R' or 'D.R' and [."].**

**Try to Do It Yourself, but remember to keep it simple. My solution next time.**



'Another winner in The Hobbit class. It's a complex real time adventure which will keep devotees puzzled for hours.' *DAILY EXPRESS*

'Sophisticated, rich in atmosphere and amazingly detailed, Sherlock is a game which no Spectrum owner will want to be without.' *MICRO ADVENTURER*

'Sherlock is a long way ahead of the rest of the competition.' *PERSONAL COMPUTER NEWS*

'In Sherlock you can not only talk to other characters, of whom there are at least thirteen, and ask them to do things for you, but you can also interrogate them and even discuss the case.' *SINCLAIR USER*

'Sherlock Holmes has been well worth waiting for with an 800 word vocabulary, real Victorian transport system – cabs and trains and all, and a cast of characters, peopling screens of graphics designed by Mugsy man Russell Comte.'
*YOUR COMPUTER*

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'Sherlock must be the most complex adventure ever created.

The creation of atmosphere is superb (more like that of a novel, than a computer game) in fact playing the adventure feels more like acting than playing a computer adventure.

The characters in Sherlock behave just as they would in real life and have a very human feel to them, not only in the way they react to situations, but also in their displaying of human emotions.'
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'Rich mental imagery.'
*CRASH*

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'Sherlock is a superb program and will provide many hours (hours? months more likely) of stimulating entertainment.'
*PERSONAL COMPUTER NEWS*

'Sherlock is an excellent adventure bursting with atmosphere, challenge and inventiveness.' *PC GAMES*

'Sherlock the adventure is about as devious as Sherlock Holmes the master sleuth.' *POPULAR COMPUTING WEEKLY*

# Available for C64 and Spectrum 48K

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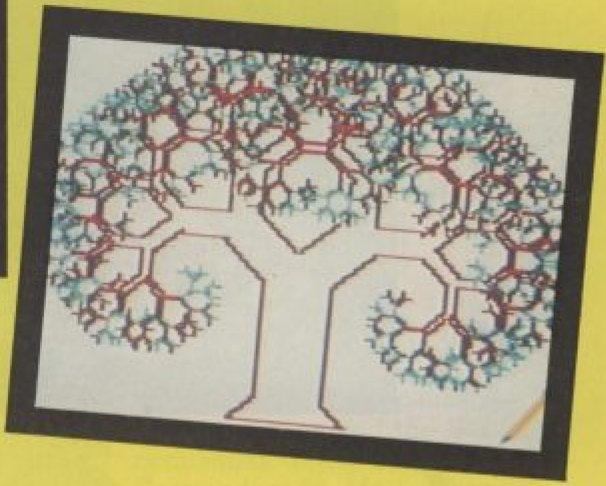
# 50 Designer's Pencils To Win

**Putting graphics up on screen can be a tricky job for the non-professional programmer. To make it slightly easier a number of graphics software packages have been launched recently. One of the best of these is Activision's excellent Designer's Pencil. We have fifty copies of the Pencil — worth £9.95 each — to give away in our simple-to-enter competition.**









The Designer's Pencil is Activision's first foray into utility programming and — if the quality of the graphics tool is maintained the future looks good for 64 owners.

Activision established themselves two years ago as the leading American video games company — writing games for the Atari VCS.

Their conversion to the computer has been about the only successful transition that a leading video games company has made. All the others have gone bust or faded into obscurity.

Games like Pitfall I and II, Decathlon, Zenji, and Ghostbusters have kept Activision in the top five of computer games companies in the world. Much of this knowledge has been incorporated in the Designer's Pencil.

The Pencil uses a programming language called PROG. Options are chosen from a menu with the joystick. It's all simple to use and easy to understand. Unlike standard drawing programs the Pencil also includes the option to use sound functions of the 64.

As well as choosing options with your fire button you can also use the joystick to draw free-hand directly on to the screen. The Pencil shows you all the programming that is required to create a graphic as you draw it through a window on the screen.

Winning a copy of the Pencil is as easy as using the Pencil itself. All you have to do is complete your general knowledge quiz on designers and send it off without delay to **Commodore User, Priory Court, 30-32 Farringdon Lane, London EC1R 3AU.** *Entries by 15th February please.*

The competition is not open to employees of EMAP Business and Computer Publications. Entries should reach this office by no later than 15th February 1985. The editor's decision is final and no correspondence will be entered into.

### QUESTIONS

1. Ghostbusters the computer game was designed by
   - (a) David Crane
   - (b) Ray Parker Junior
   - (c) Ferdinand De Lesseps

2. Princess Diana's wedding dress was designed by
   - (a) Hardy Amiss
   - (b) David and Elizabeth Emmanuel
   - (c) Jasper Conran

3. CAD stands for
   - (a) Computers Against Disarmament
   - (b) Can Anyone here Dance
   - (c) Computer Aided Design

*NAME* ........................................ 1 ☐

*ADDRESS* ........................................ 2 ☐

........................................

........................................ 3 ☐

*If I won a copy of the Designer's Pencil I would use it to (please complete this sentence in not more than twenty five words)*

........................................

........................................

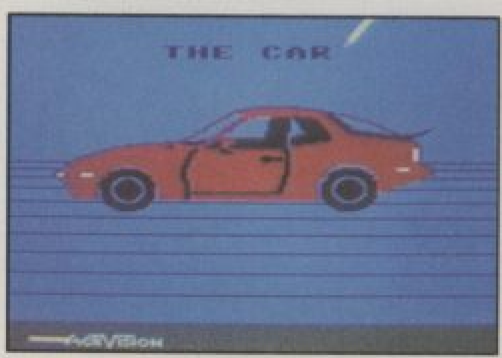
........................................

........................................



# From Paintpots To Pixels

To get the most out of the graphics capabilities of your Commodore 64, you'll need to buy some graphics software, and there's a lot of it around. Generally, products fall into three categories: graphics editors that let you design characters and sprites, extended Basic packages that specialise in graphics commands, finally there's fully-fledged hi-res drawing packages. Dermot Williams has sampled a few products in each category — and has drawn some conclusions.











**Main picture shows one of the pictures you'll find on Doodle's demo program, so good they put it on the package's front cover.**

**Sports car, sailing boat and steam engine, courtesy of Activision's Designer's Pencil. The fourth illustration shows a multicolour sprite being created on Supersoft's Graphics Designer package.**

**by Dermot Williams**

# Graphics Editors

## Romik Graphics Editor

*Graphics Editor* is available currently only on tape, and it costs £14.99. Plans to release it on disk are still in their early stages. As its title suggests, the program allows you to design your own graphics in three main areas: characters, sprites and screens. The program runs automatically after loading and displays a menu of the three above options.

So let's start with defining characters. The character being edited is displayed both on an 8 by 8 grid as well as in normal size. The complete character set is also displayed at the bottom of the screen for reference. In addition, groups of characters can be viewed together in a 'viewing window'.

To edit the character you must use the keyboard to position the graphics cursor around the grid, turning pixels either on or off. The program also provides commands for working on the character as a whole. So you could clear it, invert or flip it round both the horizontal and vertical axes — even scroll it vertically or horizontally.

The 'M' command gets you into multicolour mode. However, the grid doesn't operate in multicolour; the character on the screen is still 8 by 8 so to choose the colour of a multicolour pixel, you must edit two bits.

That leads us on to sprite design which uses the same general method. The sprite is displayed on a large grid, as well as in its four normal sizes. A display window allows four sprites to be viewed together.

Generally, you get the same editing and manipulating commands as for the character editor, but there is one extra and useful feature. You can display a series of sprites in the display window, making it easier to design animated sprite sequences.

Lastly, the screen editor allows screens of user defined characters to be composed. A portion of the screen may be defined as a 'block' to be moved, scrolled, and inverted just like sprites and characters.

**Having designed your character, sprite or screen, you'll want to include them in your programming. Each section in the *Graphics Editor* allows the user to save his or her work on to tape or disk. The manual, which is clear and easy to follow, includes a short routine for loading those files for inclusion into your own Basic programs.**







**The first screen you see when you load Talent's Panorama (H) is the main menu, showing its extensive range of one and two letter commands.**

## Supersoft Graphics Designer

This package is a little cheaper than Romik's, selling at £9.95 for the tape version and £11.95 on disk. *Graphics Designer* has two options, allowing you to design your own characters and sprites.

Let's start with the character editor, which displays a large designing grid as well as the whole character set. To work on the grid you can use either the keyboard or a joystick. Like the Romik package, there's a wealth of commands to manipulate the character in various ways: you can clear it, flip it around either axis, invert, scroll and rotate around 90 degrees.

To design shapes of more than one character, you can define a window of up to 32 characters. This is displayed to the left of the grid, the next character in the window being automatically brought on to the grid, allowing you to work on the whole window easily. Commands such as rotate and flip may be applied either to the whole window or only the current character being edited.

Graphics Designer also features a multicolour mode. Here, the cursor doubles in size, and at the side of the screen are displayed the three selected colours, and a pointer that indicates the colour the cursor is currently using. So there's no bit twiddling to do — it's very easy to use.

On to sprite design: here the grid is larger and the current sprite (like the Romik package) is displayed in each of its four possible sizes. The sprite is designed and edited on the grid using the keyboard or joystick.

Funnily enough, load and save commands have been named OLD and KEEP. They'll allow you to use either tape or disk. The manual included has a neat little program for transferring your work from memory into Basic DATA statements so you can incorporate your designs into your programming work.

**Finally, which one should you choose? If you don't really want or need the screen editor in Romik's Graphics Editor, Supersoft's package is generally easier to use and a little more versatile for sprites and characters — it's cheaper too.**

# Basic Commands For Graphics

## Zipprint Graphix IV

There are plenty of packages around that extend the Basic commands available to your Commodore 64. Most of them, though, give a range of commands that cover graphics and a whole lot of other facilities. *Graphics IV* is one of the few programs available that specialises in graphics, adding 19 extra commands to Basic. It comes on cassette only and costs £9.99.

Eight of those commands are dedicated to hi-res graphics. The HGR command selects hi-res mode, giving the option of a four-line text window at the bottom of the screen. HCLS clears the hi-res screen, and COLOUR, MOVE, DRAW and PLOT allow points and lines to be drawn. PAINT covers areas with colour and PUT allows text to be incorporated on the hi-res screen.

When the package is loaded, it automatically copies the character set into RAM so the user can easily define them. In fact, the CHARACTER command is provided for that purpose. CMODE selects which character (upper case/graphics or lower/upper case) your commands are operating on.

Other commands are BORDER and BACKGROUND for defining the

# Graphic packages for the 64

# From Paintpots To Pixels

colour of the aforementioned, CURSOR for moving the text cursor to any x,y position on the screen, and BLANK/UNBLANK for inhibiting the Vic chip. This is what happens when the screen blanks during a cassette or disk operation and is useful if you want to use hardware which has timing problems with the 64 — such as the old Vic 1540 disk drive.

**Unfortunately, for a utility devoting itself entirely to extending the 64's Basic for graphics purposes, Graphix IV doesn't really have enough commands. The ones it does have are fast and easy to use, but a complete Basic extension, like BC Basic at £19.95 on tape, may be a better buy — it offers the same and a whole lot more.**

## HesWare Graphics Basic

This is a much meatier package incorporating 100 additional English language commands to Basic. Unfortunately, it is available only on disk and costs a mighty £27.95. Although the package describes itself as being dedicated to graphics, it offers not only commands for creating hi-res graphics and sprites, but for animating sprites and producing synchronised sounds.

The package operates in three screen modes: text, hi-res and multicolour. Text mode lets you list and edit programs, and hi-res and multicolour allow graphics to be displayed and programs run. Modes can be switched simply by typing the appropriate command. Function keys are also implemented for quick use of commands like Run, List and Dir.

The Border and Background commands let you change colours, whilst Line draws a line from two specified points in the x,y to x,y format. The same goes for Circle, which produces circular shapes and arcs. You specify the x,y coordinate of the centre and use the XYSIZE command to specify horizontal or vertical radii. FILL lets you fill any enclosed area with colour, specifying both the colour and the mode in the program line. It's also possible to print text on a graphics screen using GPrint.

On to sprites, which can be created and moved. The sprite editor has a 24 by 21 dot grid on which pixels can be turned on and off — the actual size of the pixel is also displayed. Sprite shapes are included on the disk. There's also a useful example to show you how to incorporate your creations into a program and how to move them around.

That takes us to creating sounds: you can turn on and off automated sounds, choosing any of the three voices and setting the ADSR envelope. Also included are commands for selecting the possible waveforms and for setting the volume. Lastly, you can print a hi-res or multicolour image to a Commodore printer or a Gemini series printer.

**The package comes complete with a 120 page manual that not only comprehensively lists, describes and gives examples for each command, but also provides a useful tutorial section at the beginning. Graphics Basic is expensive but it gives you much more than commands for creating graphics.**




## High-Resolution Graphics

## Panorama from Talent

*Panorama* is a hi-res graphics package that comes on tape (£17.99) and on disk (£19.99). On loading, the screen displays the 34 available commands. Any command is operated by typing its one or two-letter mnemonic. For example, 'L' draws a line and 'EL' would draw an ellipse. There's a status line display at the bottom of the screen call-






ed the 'crib' which displays among other things, the current x,y position of the cursor. In fact, you have a choice of three different types of cursor: an arrow, a gunsight or nothing at all.

The spacebar toggles the display between the menu screen and the picture you're working on. You can use either the keyboard or a joystick to move around the screen one pixel at a time, and the function keys can be used to move the cursor in eight-pixel jumps.

As well as drawing individual points, *Panorama* will draw and erase lines, circles and elipses. An 8 by 8 'texture block' can be defined (much the same as on an Apple Macintosh) and used to add texture to your drawings. Used with a little practice and imagination, this can become a powerful command. either rectangular or irregular blocks can be defined, which may then be textured, coloured, mirrored, erased, copied and moved.

The memory retains four different colour schemes so you can experiment easily with colour. The EX command selects which colour scheme to use to display the pictures on screen. The picture may be magnified to make editing fine detail easier. Complete masterpieces may be saved to tape or disk and also verified, merged and loaded.

**Generally, the system of using mnemonics to operate the commands in Panorama take a long while to get used to, but with a little practice you can work quite quickly. One sore point is that after each command has been entered, the computer gives either a 'pip' to indicate it was correctly entered or a wail if it was wrong. Audio feedback is a good way of highlighting errors but the constant 'pips' will have you reaching for the volume control — so you can't hear the mistakes either.**

## Doodle from Quicksilva

Quicksilva is now marketing this American product in Britain at £14.95, around half the US price. Unfortunately, it's available only on disk.

After loading the package you get a 'greeting' screen followed by the main menu. This lists the ten modes in which *Doodle* can operate — Sketch, Line, Boxes, Circles, Colour, Zoom, Copy, Stamp, Letter, Disk and Print. You can change mode at any time using the function keys and instead of the main menu, the respective mode menu is displayed. Return toggles you between the menu and drawing screen.

Each mode menu lists the commands available in that mode, in an uncluttered and colourful way. For example, in Sketch mode, you can move the cursor at nine different speeds and nine different sizes. You can fill areas with colour, invert the screen, flip the screen around the

vertical axis and save the whole screen to memory for later recall. You can even superimpose a grid on to the screen to help you plan your drawings.

Line, Box and Circle modes are similarly laden with easy-to-use commands, with as many functions as possible accomplished by the joystick. Colour mode selects the fore and background colours for working in, and sets colour cells for these colours. Zoom allows you to zoom in on any part of the screen making single pixel editing much easier.

Stamp lets you create 'rubber stamps' of small sections of your drawing which you can stamp anywhere on the screen. Copy lets you copy larger areas which have been defined in Box mode. The area can be saved to memory, be enlarged or rotated.

Finally, Disk and Print mode loads and saves to disk, and prints your masterpiece — not only on a Commodore printer but other popular models like *Epson, Okidata* and *Star*, providing you have a Centronics interface adaptor.

**In conclusion *Doodle* is not only easy to use, it's great fun as well. The manual is clear and concise and the mode screens informative. It really is child's play to use.**

## Activision's Designer's Pencil

The Designer's Pencil package refuses to fall into any strict graphics category because it throws aside Basic in favour of a programming 'technique' it calls PROG, in which you string together sequences of commands. The package costs £11.99 on tape and £19.99 on disk.

On loading the program, you're confronted by the Programming Screen, a screenful of commands divided into four sections: master commands, programming area, instruction set and prompt window. Moving around is done by either keyboard or joystick.

The master commands let you do routine jobs like running the program you've built, inserting lines into the program, deleting, clearing the screen and filing your work. The Prompt Window helps here and it gives you access to twelve demo programs.

That takes us to the Instruction Window from which you choose various drawing commands, like: Go Up, Down, Left, Right, Circle, Kaleidoscope on/off, Pencil on/off etc. There are also commands for changing background and drawing colour, setting the drawing speed, moving forwards, backwards, rotating, drawing diagonals, producing sound and music.

You use the joystick to scroll through the commands vertically, positioning the 'arrow' cursor by the one you want. The same goes for the program lines on the left side of the screen. To create a circle, for example, you'd use the Circle command, which entails specifying the radius, the format being 'CIRCLER = 112'.

With all the draw commands, you can specify variables 'A-Z' instead of figures. As in Basic, instead of just using one value, your variable can have different values throughout the program. You can set up program loops, and there's a Jump command that works in the same way as a Goto in Basic. That gives you the provision for animating parts or even the whole drawing.

Finally, it is possible to print your creations and program listings on a Commodore 1526 or MPS 801 printer. If you're lucky enough to have an Okidata Okimate 10 colour printer, you could use that too.

**It's clear that *The Designer's Pencil* is a very sophisticated package; just looking at the Demo screens with the 'pencil' whizzing around furiously is enough to inspire enthusiasm. But this is no 'pick up your joystick and draw' program, it involves actual programming and the commands used are initially just as daunting for the beginner as Basic itself. The trade-off is that this package will provide facilities for even the most hardened enthusiast.**

# COMMODORE User

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Save over £50.00 in this month's catalogue with a wider range of deals on the best of Vic and 64 products.

Some of them, like the dustcovers and the Victuals tapes, we have produced ourselves. The others are things that we regard as Good Ideas and Good Value, mostly items reviewed in Commodore User.

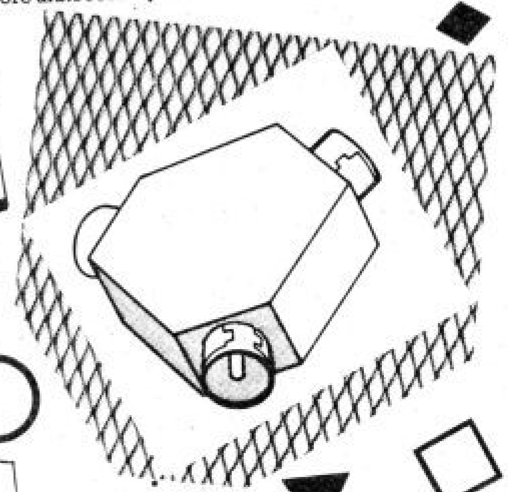
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January 1985
Thursday 24

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### The Commodore User Toolkit Cartridge

... for easier programs

AUTO automatic line numbering
DELETES deletes specified lines
FIND lists all lines containing specified string
LINES calculates number of lines in your program
MERGE merges program from disk or tape
RENU renumber program

DUMP lists names and current values
VAR lists variable names

DESIGN multi-colour sprite editor
SPRITE sets position, colour, mode
HITBACK detects sprite hitting background
HITSPR detects sprite hitting another sprite

MON Pet-type machine code monitor
USER add new commands
FUNC defines function keys
SHRINK removes REMs and all unnecessary spaces
CURSOR puts the cursor at specified position
**... and much more**

**PRICE: £27.50**

### David's Basic

... for better programs

AVG averages elements in an array
MIN finds the smallest number in an array
MAX finds the largest

PAD$ fills out a string with spaces
SEARCH searches array for given string
SORT sorts arrays

CHINKLE rings a bell
ERROR intercepts program errors

CIF conditional IF
CEND conditional END
ELIF Else If
ELSE Else
POP removes last subroutine from stack
PUSH puts a subroutine return address on to stack
EXEC a bit like PROC or labelled subroutines
ON used as ON – key GOTO or GOSUB
SWAP loads another program, retaining all variables

CLOCK continuously displays the time at stated position
COL$ simplifies use of 15 colours
LWIND loads a ready-to-go screen display
DISP displays centered message

DATE$ turns a numeric date into a string
DATIN foolproof date input routine
GENIN foolproof input routine
NUMIN foolproof numerical input

PRINT% justifies columns of money figures
PRINT# adds true printer tabs
SCOPY screen copy
**... and 18 other commands**

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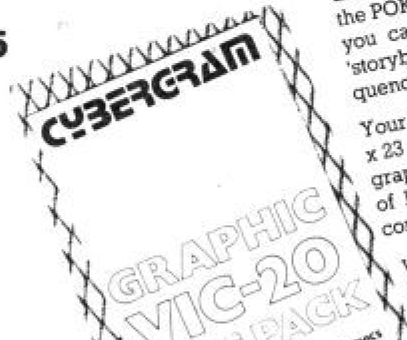
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### DESIGN YOUR OWN VIC SCREENS

Brilliant idea, though it's simple really; the Cybergram Designs Vic-20 Graphics Aid Pack is a set of overlays and printed sheets on which you can immediately see the POKE locations you need for display and colour; and you can use successive sheets to set up a specific 'storyboard' from which to organise and visualise the sequences in a graphics program.

Your pack includes planner sheets for the standard 22 x 23 screen and plotter sheets for the 1023 x 1023 hi-res graphics using the Super Expander; you also get a set of handy character designer sheets that simplify the construction of your own shapes.

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Whitby Computers' amazing tape makes the Commodore 64 think it's a Spectrum 48K, bit of a downgrade? True, but now you can enter Spectrum basic programs and magazine listings. Includes manual on how to program in Spectrum basic.

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## OSIRISAN Assembler/Disassembler

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## The HELP Cartridge for the 64

**All those extra commands you want!**

A programmer's aid cartridge for the 64 from Stack. Adds twenty toolkit commands to Basic (auto line number and renumber, find, step, trace, etc: plus hex-dec converter) *and* a comprehensive monitor and disassembler *and* several single-key disk-handling commands.

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## The Arrow Cartridge

**Tape save/load seven times faster!**

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## CBM 64 Basic Compiler

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***The most useful books we've found for the Vic and 64. Most by the founding editor of Commodore User.***

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For would-be programmers everywhere. It's concise and accurate with excellent line-by-line descriptions guaranteed to turn you into an expert.

### The Complete Commodore 64: Dennis Jarrett

Another excellent book – covering all the angles of the 64 to help both beginners and experts alike.

### Getting the Most from Your Vic-20: Dennis Jarrett

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### The Good Computing Book For Beginners (3rd edition): Dennis Jarrett

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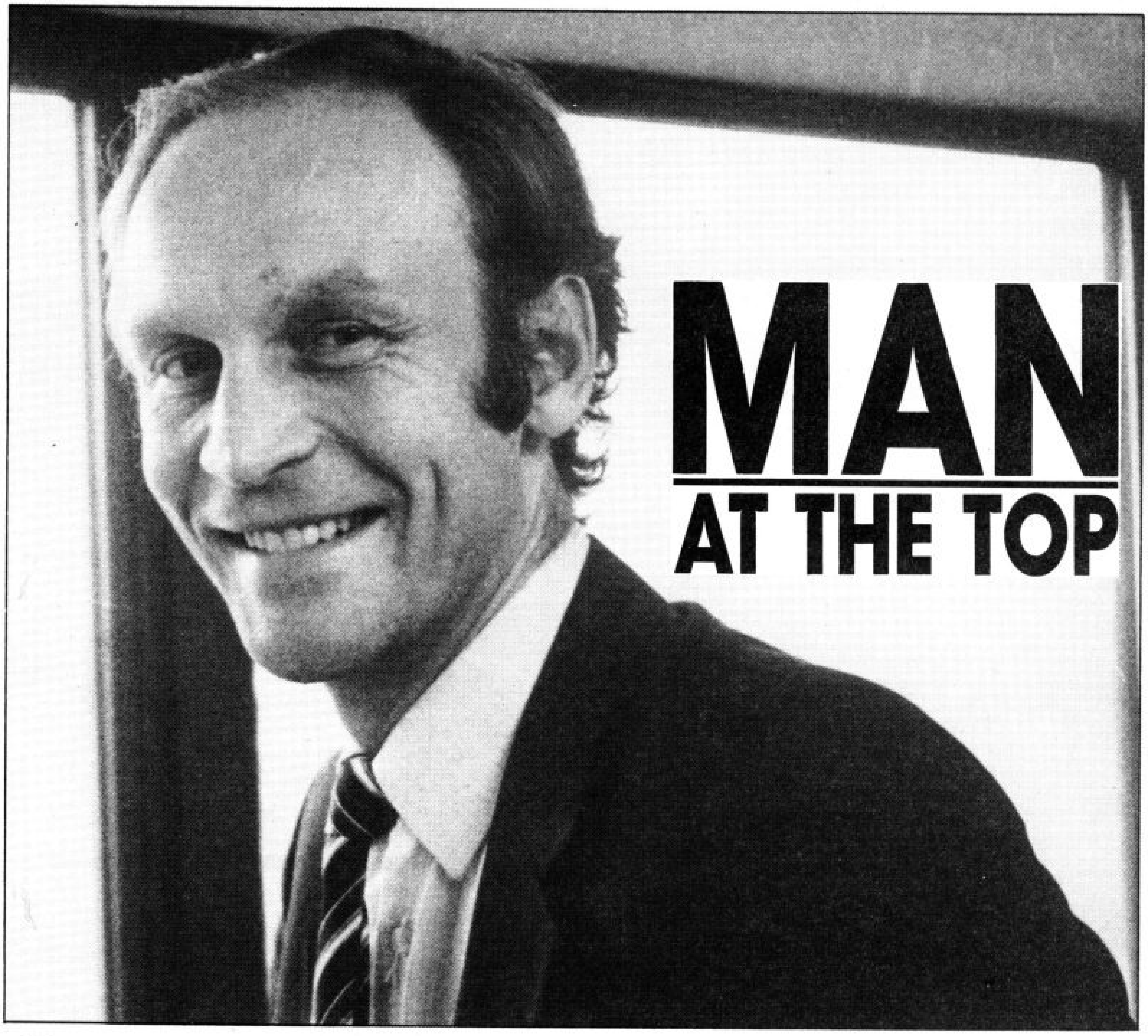
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# Howard Stanworth, Commodore UK boss, interviewed

**by Bohdan Buciak**

A great deal happened at Commodore last year. The company released two new computers, the 16 and Plus/4, it moved to new and more prestigious premises in Corby, it received the Royal Warrant and saw the Commodore 64 yet again being voted 1984 Home Computer of the Year. But Commodore UK boss, Howard Stanworth, insists it's nothing to be complacent about. So how does he see the competition, how does he view Commodore's expansion and its increasing need to offer better customer service, and what's in the pipeline for this year? Bohdan Buciak trecked up to Corby to ply him with these questions.

Howard Stanworth doesn't profess to know a great deal about the technical ins and outs of computers, and he didn't get to sit in the big chair at Commodore because he's a technical genius (like Clive Sinclair?). He describes himself as an out and out manager: "I spent about seven years in managerial positions in the hi-fi and TV industry. I left that to run a plastics company, and then I spent three years as a director of Unigate Dairies."

But he reckons his experience and his eagerness to get back into 'consumer electronics' gave him the best credentials for the job. "There's a strong connection between hi-fi and home computers. Both have grown out of their 'buff' origins into mass-market industries." But it's more the differences that interest him. "Computers are more exciting; with hi-fi you have a passive relationship, computers give you scope for personal inventiveness" — more about that later.

## Happy New Year

Last Christmas saw the cash registers ring out again for Commodore and, although Howard Stanworth will neither brag about that success, nor reveal how well Commodore actually did, he will say that the Corby plant was working "absolutely flat-out" sixteen hours per day, seven days a week to meet the demand for the whole of Europe.

Not surprisingly, the Commodore 64 remained the apple in Commodore's eye, accounting for the largest proportion of sales. But with the Christmas period over, is Commodore looking to cut the 64's price at some stage this year? Howard Stanworth's answer is




A hi-tech exterior for Commodore's new UK headquarters and manufacturing plant at Corby.

firm but disappointing: "There won't be any price reductions. You won't see prices going down like last year but you will see manufacturers putting in more features, more power — better value for money."

## Sweet 16?

That brings us to the Commodore 16 which, selling at the same price as the Vic, must surely have made people in Britain turn their noses up at that much-loved yet veteran machine. But Stanworth has a surprising revelation: "The Vic is still in production here, but we're producing more for the world market. We won't stop producing until the demand ceases." That should ensure that existing Vic owners won't go short for service and repairs.

But how well did the 16 sell over Christmas and will it ever be as popular as the Vic? Again, Howard Stanworth is loathe to reveal sales figures: "It made a remarkably spirited entry into the market, and everything we've produced has been sold before it left the production line.

"I think the 16's success has taken a lot of people by surprise, excluding us. Many software houses said there was no longer a market for a 16K machine. We've proved them wrong, and at least a dozen software houses were getting a range of software ready for Christmas. Of course, we have a range of titles of our own."

So it looks as though Stanworth's faith in the 16 has paid off, despite initial criticism that the machine had no new facilities, offered less than the 64 and was really an example of technology standing still. For Stanworth, it was a question of what you're getting for the money. "We found that a lot of people were looking for a complete system for a little over £100 — the 16 starter pack gives you just that."

The 16 and Plus/4 have allowed Commodore to offer something both at the bottom and the top end of the home computer market. So how well has the Plus/4 been doing? Again, Stanworth shows characteristic reticence. "All I can say is that our expectations of demand for the machine have been fulfilled, but we've not been able to supply all the demand." And that's a lengthy way of not saying much.

## Weighing up the competition

Despite all this vagueness, it looks as though the Christmas spoils were split fairly evenly between Commodore and Sinclair, establishing both at the very top of the market. "These two are now seen by users as the right products to have. Nobody likes to think they're buying a dead-end product. They want to be sure that they're buying from a company that's going to be around indefinitely" — a typically cautious way for Stanworth to say that Commodore is here to stay.

But so is Sinclair, always ready to do

*continued on page 73*







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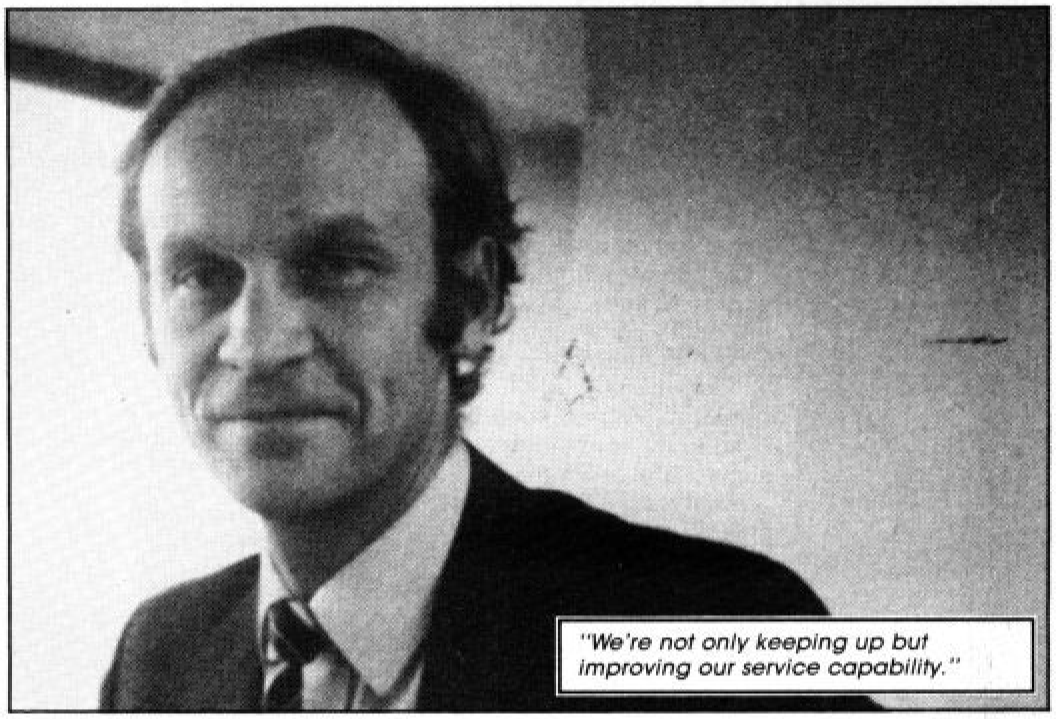
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# MAN AT THE TOP

*continued from page 71*



*"We're not only keeping up but improving our service capability."*

battle: for example, its Spectrum Plus with its 'real' keyboard, was probably designed to make prospective Commodore 64 buyers think again. But Stanworth was not shaken: "I believe the customer is sufficiently educated to know that £50 extra for a keyboard is not good value". Or, to put it another way, you'd be silly to buy one.

On the other hand, the Amstrad machine does display very good value, but Stanworth doesn't see that as a serious contender either. "It hasn't got the distribution to affect our sales seriously." By that he means you won't find it in as many shops as the Commodore 64. Whether he feels it's better than the 64, he's not saying.

And that brings us to the people backing MSX, who must have spent a fortune bombarding you with adverts during the Christmas period. Howard Stanworth is more prepared to be outspoken here: "Criticisms that MSX is yesterday's technology and that it's over-priced are both absolutely valid and the reports are that the customer has recognised that.

"The Japanese are adopting the same tactics they've used in markets like hi-fi — producing established technology very well to try and get a market share. But I'm not complacent about MSX because you can't be sure what they'll do next year. They're gaining experience — but it's painful. We're not worried now but we don't take Japan lightly."

Neither is he taking lightly former Commodore International boss Jack Tramiel's acquisition of Atari and his drastic price-cutting of the Atari 800XL computer. But does it bother him that Tramiel is reputedly waging war on his former company? If it does, it's not showing: "Commodore dominates the world market. If you're going to be in the market, you've got to attack the market leaders; he'd have been pretty dumb to say he's attacking Coleco. Business is business — I've no axe to grind."

## Servicing the user

With Christmas over, the number of people owning Commodore computers has increased again by leaps and bounds. That may be good for Commodore but not so good for its customers who need service and support, an area in which Commodore already has a less than admirable reputation. Stanworth asserts he's aware of the problem. "We almost tripled our sales last year, that's bound to give us growing pains." That may sound like an excuse, but Commodore did have moving to a new location to contend with. Still, can he assure new customers that they'll get the kind of support they need?

"We're not only keeping up but improving our service capability. We're now in much better shape to cope with the post-Christmas service requirements this year than last." In what way? "A lot of changes have accompanied our move to the new factory. We now have a customer repair turnover of 2-3 days. People don't realise that most of the delays occur when the computer is travelling to and from us. We've also got more technicians, better equipment and better administration to deal with those repairs." It sounds good — whether it will work out in practice is still to be seen.

Many people, though, just want help with technical problems. What's Commodore doing to smooth those troubled brows? Again Stanworth has an answer ready. "When we moved here, we restructured the Information Centre and created grades for which our advisors had to qualify. They have to be able to explain technical things in a non-technical way.

"But you have to draw the line somewhere. Given the nature of our business, I don't think we'll ever be able to answer all the questions thrown at us. There are extraordinarily bright users out there — and lots of them." To overcome that problem, Howard Stanworth suggests people write direct to Commodore UK with their highly technical problems which will be passed on to the Technical Department.

## Future prospects

Having achieved so much already, what more success is still to be gained? It's rumoured that the company wants more success at the business end of the market. "Yes, we want to re-establish our presence as a front-runner in business computers. But that won't be detrimental to the home market. I believe that the markets are converging — in twelve months time you won't be able to make a rigid distinction between the two, both in technical specification and the way they're sold."

And the computer that may bridge that gap is the temporarily-named 'Lorraine' computer from Amiga, the American company Commodore has just bought out. Not surprisingly, Stanworth is keeping all the juicy details under his hat. "We don't talk about future products in detail".

One future area Stanworth will talk about is Compunet. He sees it as one answer to claims that the home computer market is well and truly saturated. "Communications networks and machine to machine communication is the next reason to buy a micro," he asserts. "I'm very excited about Compunet and the ways it can be enhanced. It's even got potential to give the user more processing power — and that may happen in the long term.

"But for most of us, it's a whole lot of fun because everyone can play. You're not just fed information, it's a community and a method of expression — people can put up what they like. That means Compunet has an organic life of its own, and that's what excites me."

Obviously Compunet is looking to attract lots of users and there is no inherent limit to its size. But, according to Stanworth, "Its success will not depend merely on the products and services available but on the inventiveness of its users. The software market has thrived on the inventiveness of usually young people — so will Compunet."

**Howard Stanworth's view seems to be that the home computer market will never reach saturation point because there will always be reasons for people to buy them. This year the main attraction may be communications networks. Next year, there'll be different bait on the hook. If Howard Stanworth knows already what it will be, he's not telling.**

# book look

We can agree with Michael Richter that '*Advanced* BASIC *Programming* is not a contradiction in terms' (p.1). Probably large numbers of Commodore enthusiasts who work in Basic find themselves looking for ways of improving or speeding up their programs. And they know that very often these ways do exist.

It is for such that Mr. Richter writes. Unfortunately, though, although he has much to say about the hardware itself, there is little that tells us how to use it. Apart from some useful tips in chapter 3, *Mechanics of a Program*, there is little to help us with our own programming.

There are program listings. Some of these are long; all are written in lower case and with some unfamiliar instructions for control keys. (c-d) is obviously 'Cursor down', but what do we make of: 9020 print''(clr) (grph) (home) (home) (tset) (c-d) . . . . . (c-d) ''spc(39)'' (bset) (wht)'': poke . . .?

**There is, apparently, a disk available to supplement the book, originally intended, it seems, to be supplied at the same time, but the word 'enclosed' is struck out in ball pen! Instead, we are asked to send $24.95 + sales tax to the publisher, or it can be charged to Visa or MasterCard. This might well help to achieve the object of the book, but makes it an expensive package.**

*George Pike*

- **Advanced Basic Programming for the Commodore 64 and other Commodore Computers**
- **by Michael Richter**
- **Robert J. Brady Co. (A Prentice-Hall Publishing and Communications Company)**
- **£8.95**
- **Difficult to find the wood for the trees**

The front cover invites us to 'Find out what goes on inside the Commodore 64!' The back promises that 'By the time you've finished this book, you'll be fully prepared to study such advanced topics as machine language programming and arcade graphics. You'll not only understand how a computer works, but you will have learned powerful techniques that you can use in your own programs.'

Snooping is a technique for looking into the various memory locations of the computer. This is done through some 40 short programs which the reader keys in and, it is suggested, saves. These are easy to follow and each has a detailed explanation. Inevitably, some of the explanations are complicated; computers are complicated beasts.

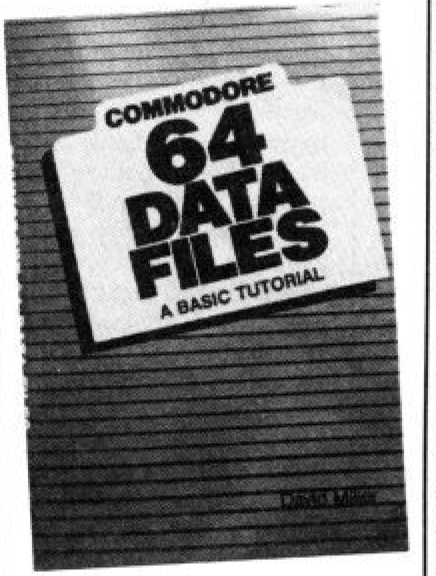
There is a lot of precise detail. For anyone who feels the need to understand what happens between the keyboard and monitor screen, this is a painless, and sometimes amusing, way of finding out.

For me, the promise on the back cover was largely unfulfilled. There is little about machine language and less on graphics. The book falls halfway — not enough for some, too much for others.

**£14.50 for 205 pages is not cheap. Anyone content to write in simple Basic will find much of the detail unnecessary. To get into the realms of machine code and arcade graphics requires very much more information than Dr. Malitz's snoops will uncover.**

*George Pike*

- **The Super Snooper Book. Find out what goes on inside the Commodore 64**
- **Dr. Isaac Malitz**
- **Datamost**
- **£14.50**
- **Falls halfway**




Close to the heart of anyone in computer marketing is a dream of millions of happy people doing Useful Things with their computers. Managing personal and small business records is certainly one such thing. Although computers like the Commodore Plus/4 include various data manipulating programs, older computers like the Commodore 64 need additional software to perform these functions.

There's no shortage of commercial programs to turn the dream of efficient data management into a reality on the 64, but writing your own programs is a different matter. The truth is that writing useful and reliable record-managing programs is hard; it's possible to know a great deal about Basic without having much idea about how to go about this task. The file-manipulating commands are sometimes awkward, but the real problem is figuring out how to structure the program once you've mastered the commands themselves.

This book is an attempt to make it possible for 'anyone' (to quote the Introduction) to write and use customised record-managing programs. I feel this to be a bit overstated, but it is at least an earnest attempt to satisfy a wide range of skill levels.

The book starts very gently, with definitions of files and related terms, some discussion about how Commodore implements files, and some simple examples of creating and using files on cassette or disk. More than 30 pages are devoted just to these few topics, and commands are firmly integrated into their programming contexts. You won't find this kind of detail in books covering a more general range of topics.

Next, the book plunges right into programming a mailing list filing system. The author has made a certain set of choices in setting up this and other programs. For example, he prefers separate programs, each under the control of a master program, for each filing function, rather than one main program with separate subroutines for each function. Experienced programmers will be interested to compare the various examples to their own approaches. And beginners will have the advantage of an approach that works. One objection I have to the programming technique is the use of the Basic INPUT command for keyboard input; this has too many limitations and pitfalls for the unwary user.

There are sections devoted to both sequential and relative (random access) files. Sequential files can be implemented on either tape or disk, but relative files require a 1541 or equivalent disk drive. I found that several lesser-known quirks about Commodore files are glossed over or not mentioned at all in the book. For example, there is an easy way around the 80-character limitation on input record length. Also, in the section on relative files I didn't find any mention of the fact that you can read part of a record, but you generally can't write just part without getting into trouble.

**In summary, this book fills a real void in the literature available for the Commodore 64. It seems to me that there are too many books about game programming and virtually none about more 'serious' topics like this. The book is well-written and thorough, even if not as easy to follow or master as the author would like you to believe. If you have some background in Basic, or are working to get it, this book is absolutely essential reading before you try writing your own record-managing programs. At a price of £8.95 (for more than 400 pages) it must be considered a real bargain.**

● *Copies of all the programs in the book, plus additional programs and documentation, may be purchased as a two-diskette set for $27.50 from: C-64 FILES, AEN, 9525 Lucerne St., Ventura, CA 93004, USA.*

*David Brooks*

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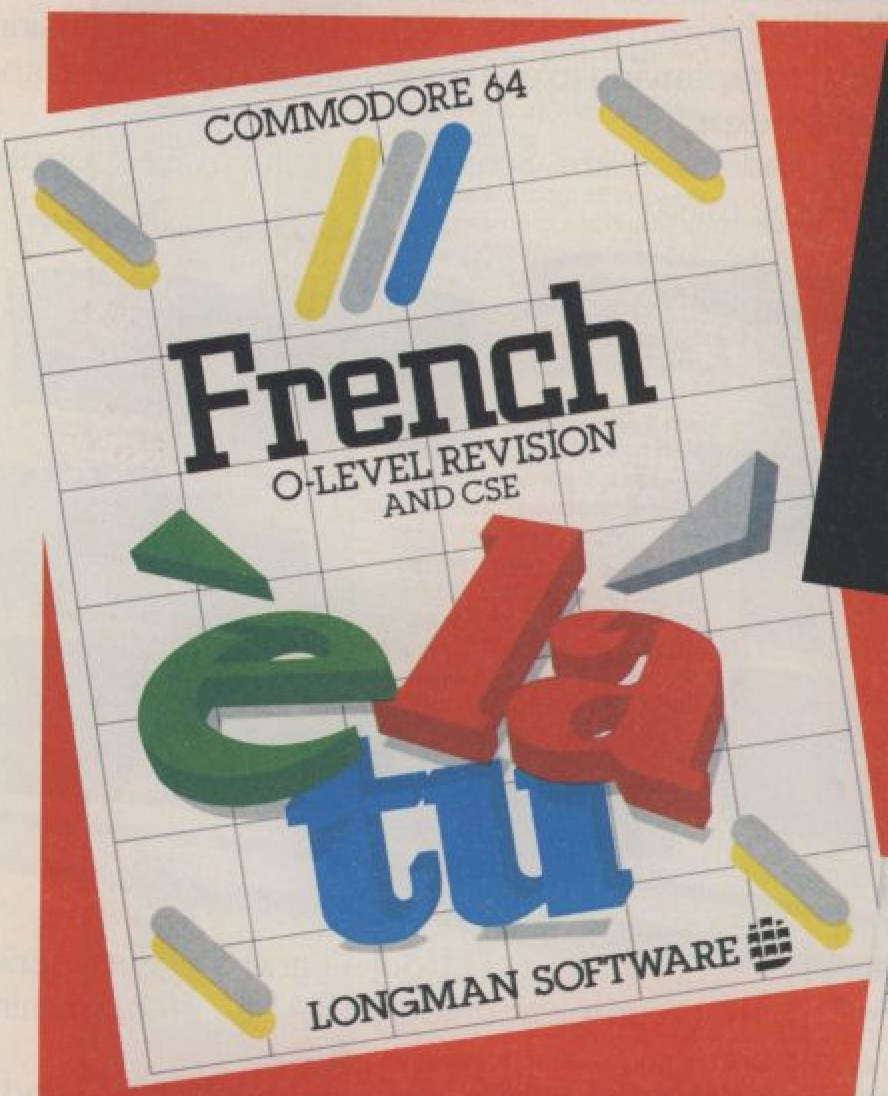
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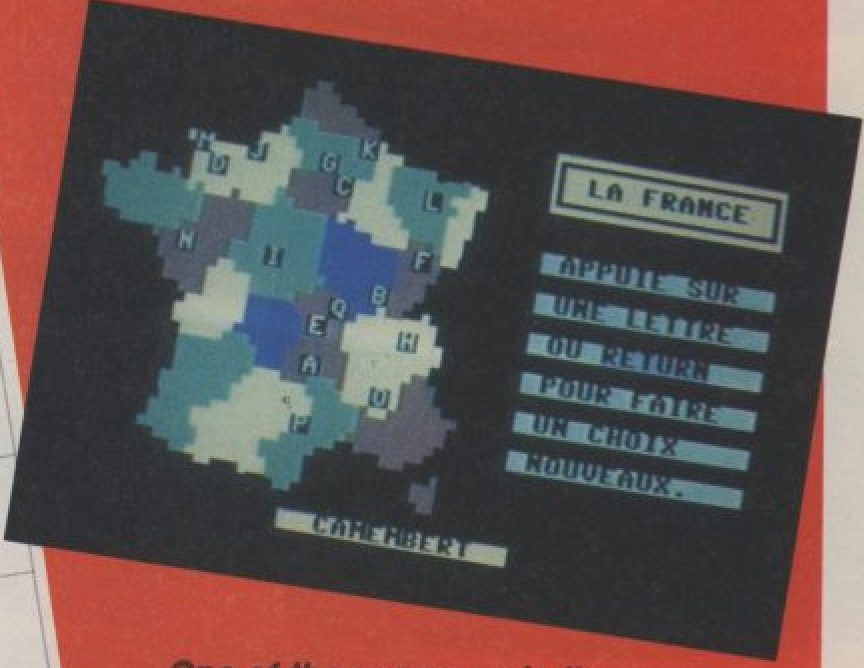


# MAKING THE GRADE

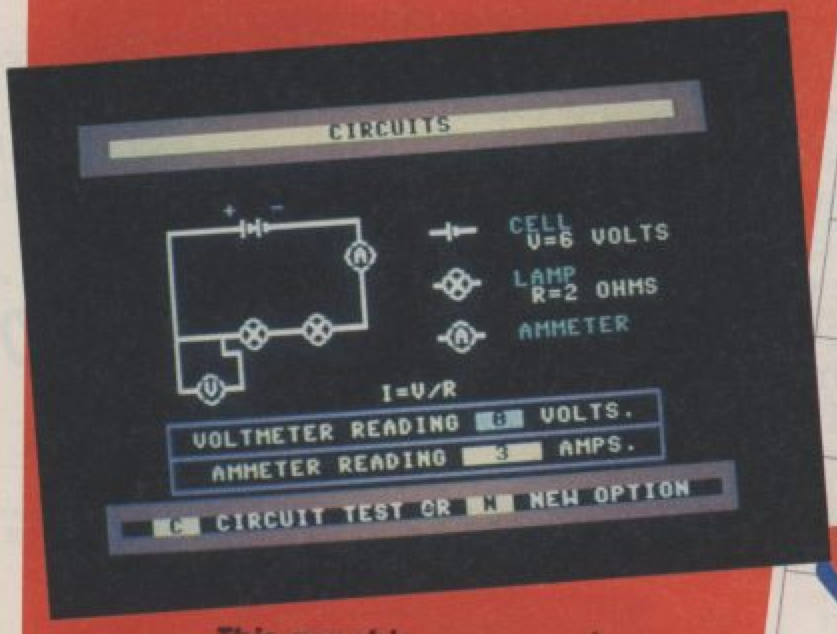
## Longman 'O' Level revision programs reviewed

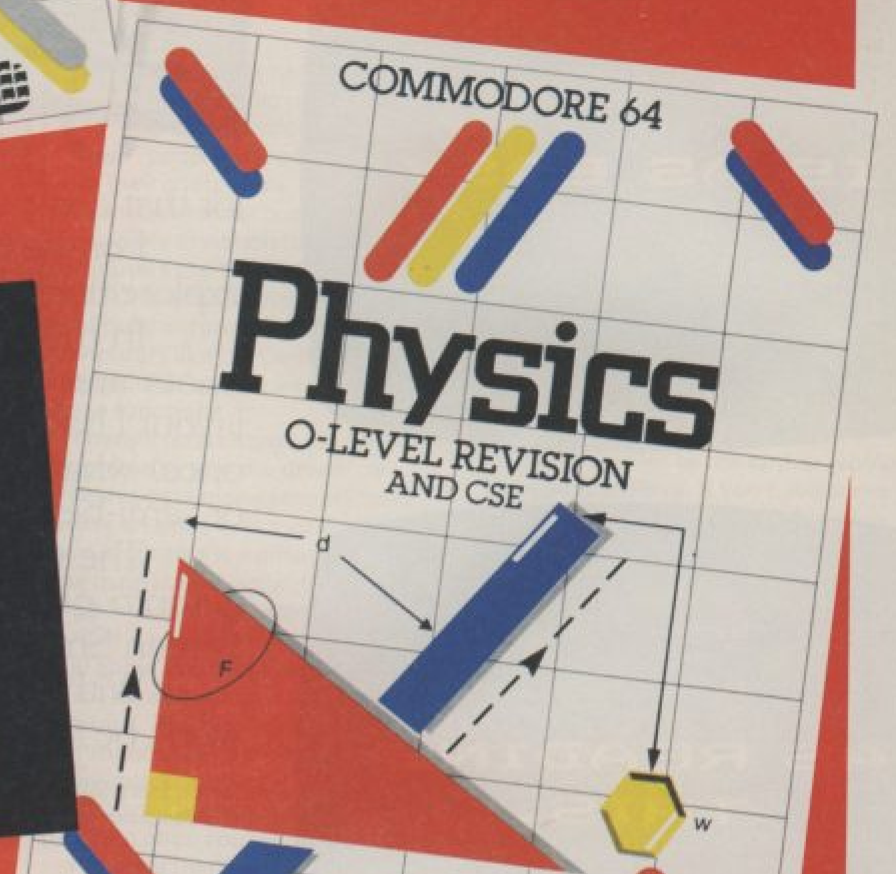
**by Colleen Young**




*One of the programs in the French course lets you identify wine and cheese producing areas of France.*




*This graphic program, in the Physics course, looks at different aspects of Ohm's law in simple circuits.*

**Last month we looked at a wide range of educational software for tiny tots and budding juniors. But the Commodore 64 has also spawned a few programs for older children, exam revision software in particular. Longman Software now has a range of cassette-based programs covering Mathematics, Physics, Chemistry, Computer Studies and, just released, French and Biology. Colleen Young, herself a teacher, finds out whether these programs will put you top of the form.**

Each subject covered in the range comes on tape and, rather annoyingly, only the latest French and Biology programs feature a turbo loader. Each program is accompanied by a slightly cumbersome leaflet which contains instructions for using the programs and notes on 'revision techniques'. Nothing really new here, though. You're told how to organise your subjects and time, how to learn most effectively and how to keep your interest going. The leaflet includes an eight-week revision planning chart and a checklist of subjects to be covered.

All tapes have a standard format in that there are five different programs for each subject covered. Although they're advertised as being suitable also for CSE candidates, I feel they'd be more useful for 'O' Level students.

The first program on each tape is called *Text*, it is simply a long list of references (something over 500) on the subject in question. You can, for instance, see a set of references on Geometry on the Mathematics tape or Heat on the Physics tape; the latter would produce a list of words associated with Heat: boiling, conduction, convection and so on. In this case, there were a total of nine words. But no actual definitions of the words are given.

The idea is to study the lists and look up any unfamiliar words. This is quite a good idea, but would, I suspect, have limited use, since you'll probably tire of it quickly. One problem is that not all the words will be familiar to a student in that they are not on his/her syllabus. (The same is true of course with revision books, though some do give advice on the different examining boards.)

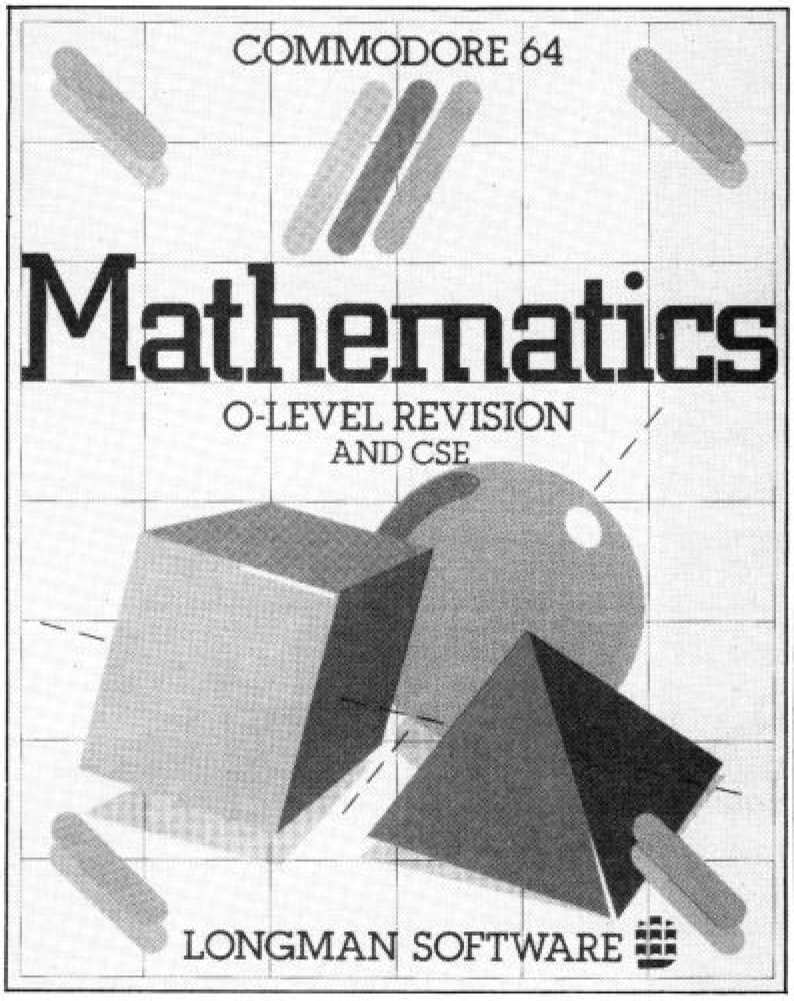
## The maths pack

So let's start with **Mathematics**, the programs (apart from Text mentioned above) are: *Transform, Trig, Stats* and *Odds. Transform* allows you to plot a figure by giving the x,y coordinates; you can then transform the figure by using enlargements (including one-way stretches), reflections, rotations and translations. Compound transformations are also allowed.

However, this program is rather spoilt by two factors: the scale is fixed and a bit of an odd choice at that; also the positive and negative rotations are the wrong way round. This is a great shame as the program is otherwise excellent — the displays of the transformed figures are very good indeed.

Next comes *Trig*, which as its name implies tells you all about triangles including Pythagoras. It allows you to enter your own data to solve triangles as well as giving you demonstrations. *Stats* will produce pie-charts and bar-charts; these are easy to produce and very colourful.

The last program on the tape is on probability, which gives the program the opportunity to include some games to give you a breather. Unfortunately the explanations given here are not very comprehensive; they start simply but suddenly introduce new ideas out of the blue! Also too much emphasis is put on a chance of '1 in 2' say, whereas children learn that a probability has a value between 0 and 1.




## Getting physical

On to **Physics**; the programs here are *Formulae, Circuits, Light* and *Machine. Formulae* gives you the opportunity to choose a topic, it will then give the relevant formulae together with rearrangements. You also have the option to enter your own data to find an unknown. The program contains a demonstration on solving equations which would have been quite nice but for a horrible error! It occurs in an equation for acceleration. Having given you the time-honoured advice which Maths and Science teachers must mutter in their sleep — 'you must do the same to both sides of the equation' — the program proceeds to multiply one side by T and at the same time divide the other side by T . . . things get worse, two Ts are then cancelled, both of which are in the denominator! This apart (though I find it hard to forget), it's a handy program if you are trying to learn a few formulae.

*Circuits* demonstrates Ohm's Law. The circuit diagrams are nice and it seems a useful program. For any electrical circuit given, you are told the values for current, voltage and resistance, then a second lamp is added and you are given the new readings. Then you're on to resistance; the program includes tests which follow on well from the tutorial section. One gripe is that text scrolls annoyingly slowly across the bottom of the screen.

The next program, *Light*, includes lenses, mirrors and ray diagrams. Well illustrated explanations are given followed by tests. The final program, *Machines*, discusses levers and pulleys. After a promising display of a pulley system what follows is rather less exciting (various formulae with explanations) though quite useful. My favourite part of this program was trying to throw a stone at a castle using the stone-throwing engine — a great incentive to learn about the Principle of Moments!

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# MAKING THE GRADE

## The right Chemistry?

The **Chemistry** tape contains the programs *Elements, Mole, H2S* and *Reactivity*. *Elements* gives data on the most significant elements in the Periodic Table. The information may be retrieved in various ways, giving a good demonstration of the way a computer stores and manipulates data, as well as useful information. The student can compare aspects of various elements using the program.

*Mole* tackles the calculation of the mass of one mole of any given compound. Tests are provided as well as the explanations; quite a useful program. Then it's on to *H2S*, which is a game — great fun! You are given a task to perform, for example, to make up some compound. You also get a list of things you need. Collecting this equipment involves running round a lab opening cupboards, if the fume cupboard is opened you need to make a mad dash for the door to save yourself.

The final section, *Reactivity*, is a tutorial and test on the relative reactivity of a series of metal and non-metal ions. Ion exchange in solutions is also covered, as well as double decomposition. It is possible to enter your own compounds to see how they behave in solution — a well presented program.

## Use your computer

On to the **Computer Studies** tape, which contains the programs *Visicode, Putin, Files* and *Logic*. Out of that lot, *Visicode* and *Logic* are the best by far. *Visicode* would be useful for teaching as well as revision; it demonstrates low-level languages very well indeed. An example program is given and the contents of the accumulator and registers shown as the program runs.

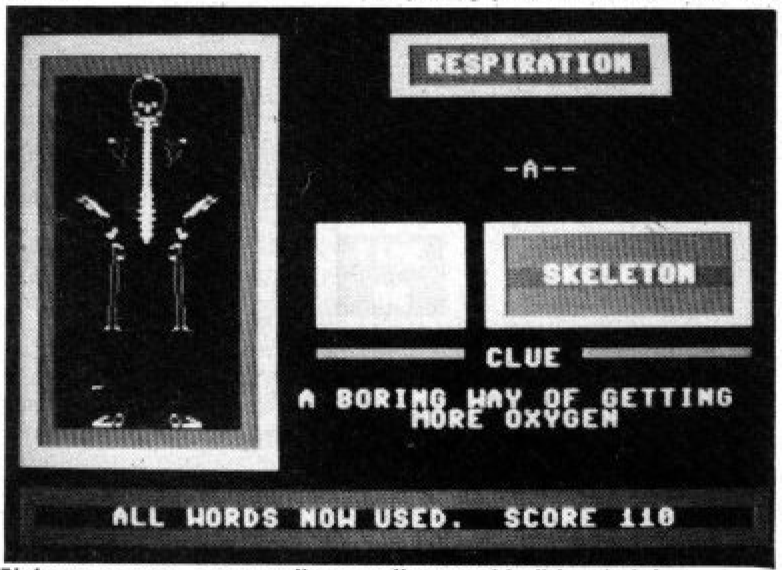
*Logic* shows how logic circuits operate and includes tests where the student has to give the output of a gate given the input. *Putin*, though, drove me mad; this is a collection of routines containing deliberate programming mistakes which the student is supposed to correct. A reasonable idea I suppose but I wasn't sure that all the effort was worth it when I ran the corrected versions. It would be easier to write your own routines in the first place.

*Files* covers what must be one of the most important aspects of the syllabus, demonstrating various file handling routines. It also lets you create files of your own. Perhaps I have been spoilt (we have *Superbase* at school) but this was a bit of a let down and does not really illustrate the topic well.

## Test your French

The French revision tape opens with two programs, Lexis 1 and 2, which attempt to consolidate your knowledge of French vocabulary. Like the rest of the package, these programs are menu-driven, allowing you to choose from a range of fourteen themes. When you've done that, you can display all the words and test yourself either in French or English.

The third option lets you type in a word and then receive its translation. That may sound useful but, unfortunately, it's very slow and no substitute for grabbing your dictionary. Lexis 2 works in the same way but extends vocabulary to around 2,000 words.




*Biology course — answer the questions and build a skeleton.*

The next program, Verbs, lists seven regular verbs, three regular reflective verbs and 38 irregular verbs. The object here is to allow you to revise the various tenses and forms. You choose various options from the menu: as well as the present, imperfect, future, perfect, past historic and present subjunctive, you get the conditional and the various participles. Corrections to wrong answers are always highlighted in red.

Moving on to the Comprehension program, you'll find it's all getting more difficult. You choose from a range of short 'stories', reading, understanding and almost memorising them because you must rewrite the story, bit by bit, being prompted by little graphic displays (rather basic) of what's happened. The stories are pretty uninspired, though. Like the earlier stages, special keys give you accents, circumflexes and cedillas. But there's some carelessness here — one accent uses the shifted 'slash' key, but you're not told it's shifted.

Onward to the last program for a little fun. So far the screen has shown only text. This program has both graphics (a lo-res map of France) and sound (the French national anthem). Despite that, this section is the least worthwhile. From a list of regions, towns, wines and cheeses, you can find out in which part of France they're located. Generally, the program does provide a novel and alternative way of overcoming the tedium involved in learning and testing your French vocabulary.

## Getting Biology taped

The Biology program starts by giving you a flowchart of how you can organise revision in four main areas: plants, animals, general, theory/experiment. You're given a list of words and concepts in each area, with stars placed by the most important. For example, if you choose 'evolution' your most important concepts, according to the program, would be adaption, competition and natural selection.

The second program is an entertaining 'hangman' game. Again, you choose from a list of options including blood, bones, ears, kidneys. By answering a question correctly, you get to put a bone on the graphically depicted skeleton. The rules aren't explained, though; you must discover them through 'scientific method'. There's a nice touch here: when you've chosen your option, a skeleton head moves across the screen and munches the words.

Next to load is *Heredity* which looks at dominance, blending, sex-linked characteristics and punnet squares. Graphic guinea pigs abound here. You're presented with a mating and asked to predict the proportion of the F1 generation which would have each possible phenotype. The punnet squares show the expected results of fertilisation, taking green and yellow peas as the example.

*Kingdoms* is concerned with the animal and plant world, allowing you to build up the characteristics of a particular specimen by choosing from lists dealing with structure, nutrition, reproduction and size/visibility. So if you chose a single-celled structure that was parasitic, reproduced by division and was microscopic in size, you'd get the answer 'bacteria'. If the computer can't find a direct correlation, it will give the closest.

Finally, there's *Food*, a program that lets you calculate a person's daily energy needs by specifying weight and daily activity. There's also a game to test your knowledge of the water, protein, fat and carbohydrate content of various foodstuffs. That's complemented by a list of their calorific values.

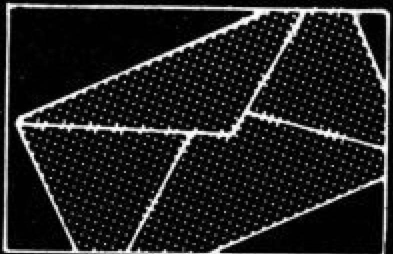
## Conclusions

**It will become apparent that the programs vary both in quality of material and presentation. But at the reasonable price of £7.95, there is certainly something on each tape to make it worthwhile.**

**It could be argued that most or all of the information presented in the courses could be found in revision text books. But that would deny the sheer novelty value that a computer must have over text books for children. Probably no child relishes revising for exams. These programs will make their less favourite subjects more palatable.**

# Write away

*This is your page: normally we write for you, but here we listen. Feel free to let us know what you think – about the magazine, about Commodore, about suppliers, about life, art, the meaning of existence or whatever. We don't print everything we receive, of course; but anything that might be of specific relevance or general interest will make it to these pages.*



## Good words for the 1520

In the December issue of *Commodore User*, one of your reader queries was, 'Which word processor gave support to the 1520 printer plotter?'. You replied that you didn't know of any word processor that gave support to the 1520.

This letter was written using a word processor and printing it out on my 1520 plotter.

The word processor that I use was supplied to me from A&C Software, 51 Ashtree Road, Tividale, Warley, West Midlands B69 2HD, tel: (021) 544 7135.

The program is fully menu driven, and at the completion of every option you are returned to the menu for further processing. The main menu options available are as follows:

- write text
- edit text
- print text
- save file
- read old file
- exit/clear memory
- memory check
- disk directory

It will also give you tab indent as well as right justification and text can automatically be centred.

The wordprocessor is called 'TEXTFILE' and in my opinion represents very good value for the £8.25 that I paid for it in September.

**H. Pepper, 35 Amethyst Road, Bilton Grange, Hull HU9 4JE North Humberside.**

**The layout of your letter was certainly impressive — but it looks as though the program can't manage the '£' sign.**

## 1520 again . . .

With reference to the article on the '1520 Printer Plotter', which appeared in the December issue of *Commodore User*, I would suggest that you are being robbed if you pay out £5 for a set of four pens. I can get the same pens in Newcastle for £3.95. Again if you go to your nearest 'Tandy' shop — they are called 'Radio Shack' in my area — the same pens are available at £1.99 for a set of three; either three black pens, or three coloured pens. Their paper rolls are also the same as Commodore's, and cheaper.

Mr Chris Durham is to be congratulated on his very clever program 'Biorhythms'. Please let us have more of them.

**T.H. Brown, 92 West Farm Avenue, Longbenton, Newcastle on Tyne NE12 8RU.**

## And again . . .

In the December issue of *Commodore User* Tommy stated that there wasn't a word processor which supported the 1520 Printer Plotter. In actual fact "Easyscript" will support the 1520 without any modification. Simply proceed as follows: before loading "Easyscript" enter the following (in direct mode):

**OPEN6,6,6: PRINT #6,1: CLOSE6**

This sets the plotter to normal lower case/shifter upper case.

Then load "Easyscript". After typing your letter etc. press (f1) then O (output) D (device) 5 (rtn) for the plotter P (to print out).

P.S. You may have guessed that this letter was printed using the 1520 and "Easyscript"!

**Steven Birks, 86 Birches Head Road, Birches Head, Stoke-on-Trent, Staffordshire ST1 6LJ.**

## Upgrade blues

With the demise of the Vic 20 there may be a number of your readers who are considering the 64 as a replacement. Let me sound a note of caution.

My original configuration was the Vic 20, 1515 Printer, Datasette and 1540 Disc Drive. On enquiry from the supplier I was assured they were all compatible with the 64. The supplier gave me a weird 'Open' command to use with the Disc Drive which was confirmed by CBM Corby. Needless to say it did not work. Further enquiry to CBM gave me a couple of 'Pokes'. This appeared to work until I attempted loading a database program. Yet another enquiry gave me the information that the 'Pokes' would not work if there were any 'Loads/Saves' in the program and the only way to ensure success was to change a chip in the 1540.

I loaded the 64 magazine tape from the Datasette and got a 60% 'Load Error' response. A friend loaned me his C2N and everything was perfect. This means I've spent £22.42 for a chip and £39.95 for a C2N. So, when a supplier tells you that the peripherals are 64 compatible — they're not.

**C.K.R. Harris, 53 Martin Avenue, Stubbington, Fareham, Hants PO14 2RZ.**

**Obviously your supplier didn't know better or was leading you up the garden path. You're right, the 1540 suffers timing problems when linked to the 64. Commodore will sell you the upgrade chip for £19.95 but charges £35 to fit it for you. By the way, the 1530 Datasette and the C2N are identical inside. Both are compatible with the 64.**

## Chart flopper

After reading the December issue of the magazine I was disappointed to see that the charts did not include one Vic 20 program, I noticed that the Commodore 64 had its own charts and was included in the top thirty. Couldn't the Vic 20 have its own top 20?

I enjoyed the screen scene very much this week, with a picture of the game on screen it makes it easier to choose a good game.

I am glad to see that the magazine now includes a Vic 20 adventuring spot, I am a keen adventurer so you can see it was good news to me.

I enjoy your magazine very much so keep up the good work and I'll keep buying it.

**Vaughan Morton, 25 Beaumont Lawns, Marlbrook Lane, Bromsgrove, Worcs B60 1HZ.**

**The very reason that Vic games hardly ever appear in the charts means we can no longer justify a Vic chart. I'm afraid the Vic Adventure Round-Up is not a regular column. Sorry.**

## Easy repeat

With regard to one of the Victuals you published in the December issue: 'Key Repeat' by William Fong. Try **POKE650,255** and hold down any key. Slightly shorter?

**Nick Weatherhead, 58 Kingsbury, Aylesbury, Bucks.**

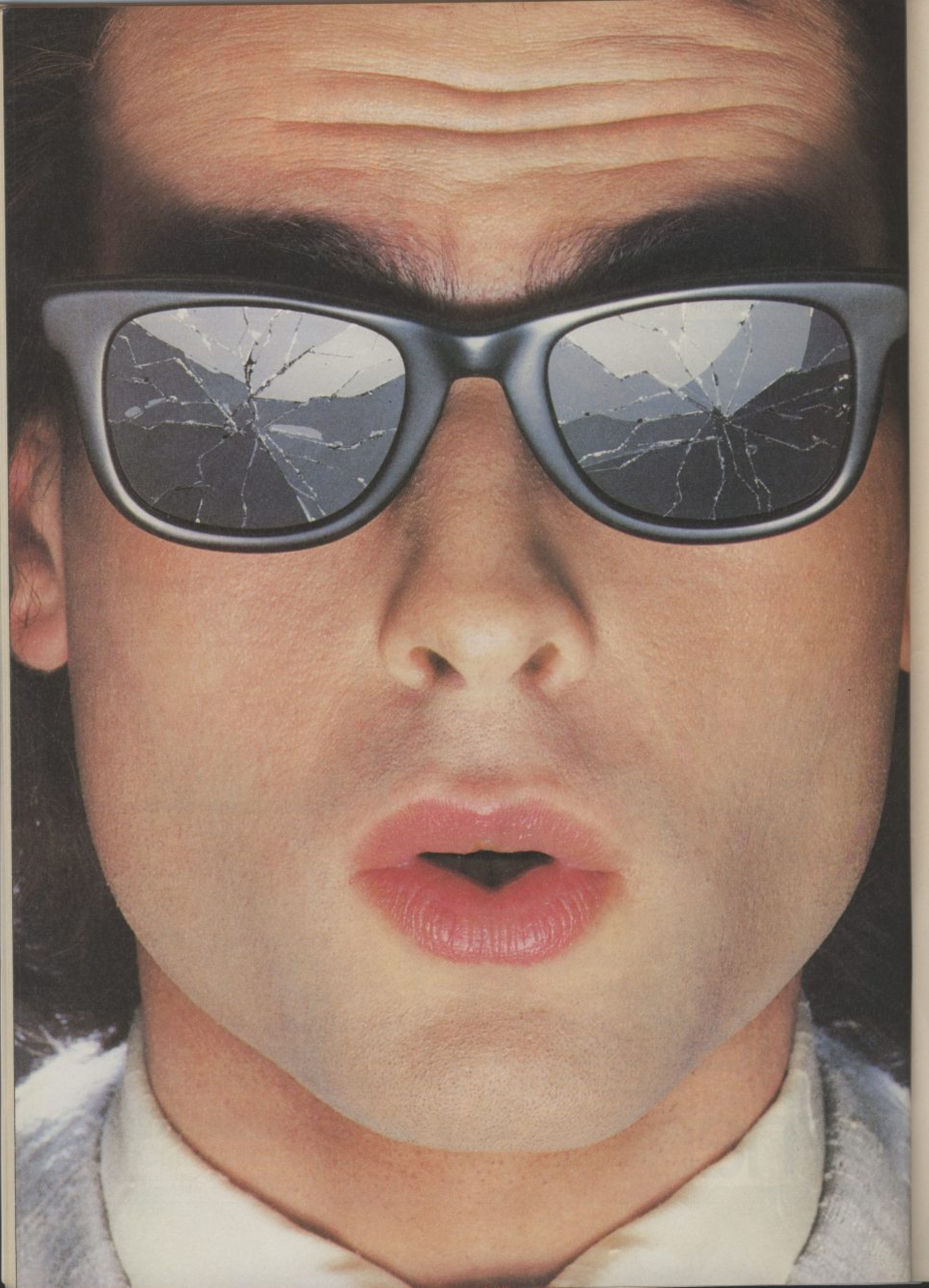
## High score

I was very glad to see the joint offer made by you and Melbourne House. I am an avid Shoot 'em up and Olympic maniac and have never ever attempted an adventure.

I read most magazines with envy when I hear of people who have completed this adventure and that adventure, so I decided why not try one? And for a game that looks a great prospect, but only cost 95p, how can you go wrong?

**David Brown, 8 Albion Road, Walthamstow, London E17.**

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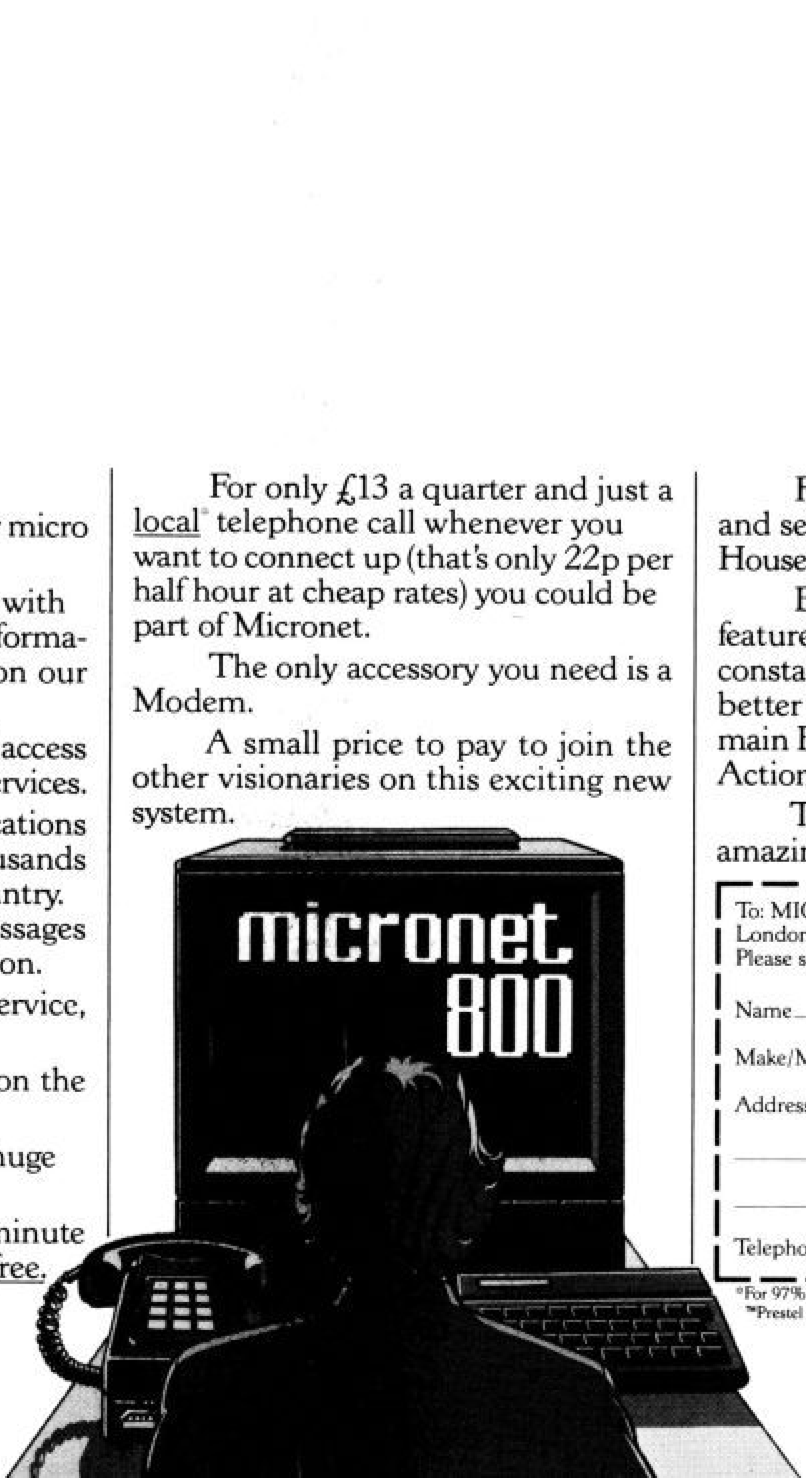
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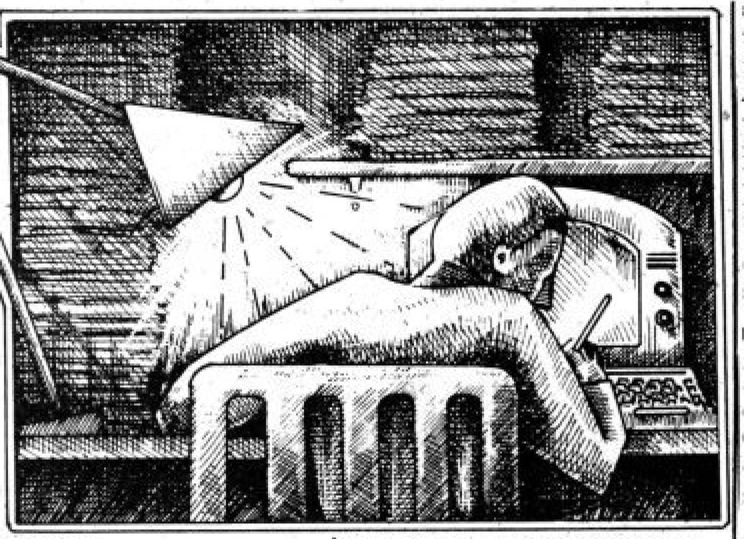


# TOMMY'S TIPS

Tommy is Commodore User's resident know-all. Each month he burrows through a mountain of readers' mail and emerges with a handful of choice queries. The result, before you, is a wadge of priceless information and indispensable advice. There's even the odd useful tip as well.

***Dear Tommy,* I have just bought a 1520 printer/plotter and the Vic Type word-processing package but it will not work with the 1520. I've tried changing the program but it's in machine-code — big problem. Can I change the 1520's device number or do I need to buy another program.**

**Another problem is the sub-commands involved in drawing with the plotter. Please could you explain them?**



Regarding changing the device number of the 1520, it was covered in the review in the December issue. It involves adding a wire to the PCB so you will need a soldering iron (or a friend who can solder).

If you want a slightly better program to enable you to print directly on the plotter then try the following little program. It allows you to correct a line on the screen before sending it to the printer and you do not have to press Return at the end of each line (unless you want a new paragraph) although some long words may get wrapped round. To end the program, type '@'. (For those who would like to try this on an 80-column printer, alter the '40' in lines 60 and 90 to '80' and alter '35' in line 90 to '75'. You will also have to change line 10 to device 4 only and delete line 15):

```
10 OPEN4,6: OPEN6, 6, 6
15 PRINT#6, 1
20 PRINT"[CLR]": P$=""
30 GET A$: IF A$="" THEN 30
40 IF A$="@" THEN PRINT:
   PRINT#4, P$: CLOSE4:
   CLOSE6: END
50 IF A$=CHR$(20) THEN
   PRINT"[CUL] [CUL]";:
   T=T-1: P$=LEFT$ (P$, LEN
   (P$)-1): GOTO 30
60 IF A$=CHR$(13) AND T<40
   THEN PRINT
65 IF A$=CHR$(13) THEN
   PRINT#4, P$: P$="": T=0:
   GOTO 30
70 CH=ASC(A$): IF CH<32 OR
   (CH>93 AND CH<193) OR
   CH>218 THEN 30
80 PRINTA$;: P$=P$+A$:
   T=T+1
90 IF (T>35 AND A$="") OR
   T=40 THEN A$=CHR$(13):
   GOTO 60
100 GOTO 30
```

As for the 'sub-commands', these move the pen relative to either a fixed start point or another point which you can specify. They can best be explained as follows:

H — plotting equivalent of HOME, moves the pen to the start point without drawing (Pen up)

I — sets a new point of origin where the pen is (called the *relative* origin)

M — moves the pen to position X,Y with respect to the start point (Pen up)

D — as 'M' but with the pen down

R — as 'M' but the X,Y are with respect to the *relative* origin instead of the start point (Pen up)

J — as 'R' but with the pen down

If the *relative* origin is set at (50,0) then **PRINT#1, "M"; 50; 150** will move the pen to (50,150) with respect to the start point whereas **PRINT#1, "R"; 50; 150** will move it to (50,150) with respect to the *relative* origin which is the same as (100,150) with respect to the start point.

I hope that's not too confusing; the best way to learn is to try it out with a few simple programs.

***Dear Tommy,* I have tried everywhere to find out what the screen locations of the block graphics and colour for the 16K expanded Vic are. Please could you tell me?**

**Also, could you tell me if there is any way of storing a picture on to tape from the visual display unit, and recalling it from tape? By the way, could you also tell me if there is any method of disabling the Run/Stop key?**

The screen and colour maps for the expanded Vic are at **4096-4607** and **37888-38399** respectively. As for storing information from the screen, the following code will do it in Basic:

```
1000 OPEN2, 1, 2, "SCREEN
     DATA"
1010 FOR A=0 TO 511
1020 PRINT#2, PEEK (4096+A)
1030 PRINT#2, PEEK (37888+A)
1040 NEXT A
1050 CLOSE 2
```

To read the screen back in, use the following:

```
2000 OPEN2, 1, 0, "SCREEN
     DATA"
2010 FOR A=0 TO 511
2020 INPUT#2, SC: POKE 4096
     +A, SC
2030 INPUT#2, CL: POKE 37888
     +A, CL
2040 NEXT A
2050 CLOSE 2
```

These routines will not be particularly fast, since you would need to go into machine code for speed, but they will enable you to preserve a screen and recall it. Note that to use them you must ensure (for the 'save' at least) that the action of calling them does not put text on to the screen.

Therefore incorporate a line **GET F$: IF F$=CHR$ (133) THEN GOSUB 1000** somewhere in the main loop. Pressing **f1** will now cause the routine to store the screen. You must ensure that the tape recorder is already set up to record *and press the play/record buttons before pressing* **f1**, otherwise you will get the warning message on the screen which will be saved along with your masterpiece.

Lastly, **POKE 808, 251** will disable the RUN/STOP key — simple as that.

***Dear Tommy,* I am doing some development work with my Commodore 64 and 1541 disk drive for the manufacture of steel costings.**

**The contents of the program I do not want to be available by listing on the printer or screen. Once the program is Run the 'Run/Stop' key has been disabled and I have made it cold start upon an error.**

**However, straight after loading, the program can still be listed; it needs to load and run in one operation. Is this possible for me to do?**

This query gives me the chance to try out a short auto-run program that I have had in the back of my mind for ages. If you're sure no-one is looking over your shoulder I'll show you how to do it. Write your main program as normal and debug it. When it is running perfectly, store it on the disk as "P2 <DEL> <DEL>". With P2 loaded into the machine type the following in direct mode: **PRINT PEEK (46); PEEK (45)** and write down the two values that appear on the screen.

Now type NEW and then the following program:

```
10 POKE 46, X:POKE 45, Y:CLR
      (replace X and Y with the
      values you wrote down)
20 PRINT "<CLR> <CUD4>
   <CUR5> PROGRAM
   LOADING-PLEASE WAIT"
30 LOAD"P2<DEL><DEL>",8
40 END
```

(The <DEL> <DEL> are added by closing the quotes, then pressing 'SHIFT INST' twice, followed by the delete key twice. This ensures that the main program has no name and so cannot be loaded directly from the disk. Check the program *very carefully* and then

Tommy's Tips

type the following in direct mode exactly as shown (replacing <CLR> by 'SHIFT CLR/HOME' of course):

**POKE44, 0: POKE43, 198**
**<RETURN>**
**POKE198, 0: POKE631, 82:**
**POKE632, 85: POKE633, 78:**
**POKE634, 13: POKE198, 4:**
**?"<CLR>": SAVE "P1", 8**
**<RETURN>**

Ignore the Syntax Error you will get and turn off the machine immediately after saving the program as the start of Basic has been altered (note that if you make a mistake in any of the direct commands you will have to start again from scratch). To run the loader program, type **LOAD "P1", 8, 1.**

This will alter the start of memory to include the input buffer. By POKEing 'RUN' into this buffer we have ensured that it will be actioned as soon as the program is loaded, making the first program auto-run. This then sets the memory to the correct size and auto-runs the second program. Note that this method will NOT work with the cassette as the cassette buffer gets overwritten when you try to load the first program.

***Dear Tommy,* I have seen a number of ads for a 64K Ram card for the Vic 20. The reference guide says the maximum expansion is 32K. Can the Vic be enhanced to 64K or are there drawbacks?**

**If a 40/80 column card was also added, would this make the Vic 20 a viable word-processing/business computer comparable to the 64 (assuming the addition of other peripherals and software being available)?**

The Vic *cannot* be expanded to access more than 27.5K from Basic or 34.5K from machine code. What these 64K RAM packs do is to give you *alternative* memory locations in the form of 'pages' of memory that can be swopped in and out. They have their uses, since some of them will allow you to store more than one program in memory and switch between them at will, thus saving valuable time loading from tape. However, you still have to load the programs in initially unless the RAM also has some form of battery back-up. What these RAM packs will *not* do is to turn a Vic 20 into a Commodore 64.

With regards to a 40/80 column board, these can be extremely useful if you want to use a Vic for regular wordprocessing or stock accounts and spreadsheets, for use in a small business and you don't want to upgrade to a bigger computer. While they will not give the memory of a 64, thus limiting the amount of data that can be stored at one time, this just means that disks are a must for serious use.

Software *is* available for such boards, but usually only from one company since each board works slightly differently and the software is usually written specifically for it. You will also require a monitor, since none of these boards will work with a standard TV.

These are just two of many queries relating to User Defined Graphics on the expanded Vic. One of the problems with redefining the character set on the Vic is that it can only be done within the original 5K RAM that is permanently in the machine. With the unexpanded or 3K Vic there is no problem since you can position the new character set under the screen memory and move the top of Basic down.

Unfortunately when the Vic goes over 8K RAM then the screen moves down below Basic, leaving no room for the character set. The only solution is to move the bottom of memory up and fit the new character set between the screen and start of Basic. Because you are now moving the start of Basic it is not possible to do it from within a Basic program.

What you need to do is write the program from the new start position, having altered it in direct mode, then save the program and reload it using the command **LOAD"filename",1,1.** However, unless you use a m/c loader program which alters the start of Basic pointers you will still have to do it by typing the commands before loading the program; there is no easy alternative in Basic.

To move the start of Basic type:
**POKE44,24: POKE43,1: POKE642,24: POKE641,0: CLR: POKE6144,0**

To move and relocate the character set use the following code in your program:

```
10 FOR A=0 TO 1023
20 POKE 5120+A,
   PEEK(32768+A)
30 NEXT A
40 POKE 36869, PEEK(36869)
   OR13
```

Note that the character set must begin on a 1Kbyte boundary. Since the screen starts at 4096, the next boundary is 5120. The minimum character set requires 1024 bytes, hence Basic has been moved to 6144; if you want more than 64 characters you can move the start of Basic even higher.

# Ad Index


Adamsoft .......... 21
Adventure International .......... 45
Anger .......... 46
Anirog .......... IFC & 49
Audiogenic .......... OBC
Beyond .......... 35
Brother .......... 17
Calco .......... 46 & 54
Cheeta .......... 25
Commodore .......... 3
DACC .......... 40
Deals for Readers .......... 65, 66, 67, 68
Digital Integration .......... 58
Dorling Kindersley .......... 75
Electronic Aids .......... 69
Evesham Micros .......... 54
First Publishing .......... 12
Handic Software .......... 20 & 21
Holt Saunders .......... 7
Integrated Systems .......... 20
Interface .......... 24
J & J Gilmour .......... 20
Kosmos .......... 50
Llamasoft .......... 34
MPS .......... 46
Melbourne House .......... 33 & 57
Micro-de-bug .......... 54
Micronet .......... 82, 83, 84
Midland Computers .......... 69
Mikrogen .......... 14
Mirage .......... 16
Mushroom Software .......... 40
New Generation .......... 64
Ocean .......... 10 & 11, 69
Oxford Computing .......... 50
SMT .......... 9
Six 4 Supplies .......... 38
Sixty 4 Plus .......... 46
Sixty 4 Software .......... 6
Sophisticated Games .......... 40
System 3 .......... 4
Taskset .......... IBC
Ultimate .......... 18
Whitby Computers .......... 63
Zoomsoft .......... 69



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**CBM 64 owner** Wants to swap software with European, Australian and American owners. Have many good files. Please write. (All letters answered). Send your lists to: Jonny Mikalsen, Box 124, 5460 Husnes, Norway.

**VIC-20 owners**, interested in languages (French, German, Italian, Spanish)? If so send SAE to:- M. Lenihan, 109, Clive Road, Fratton, Portsmouth, Hants, PO1 5JD for your free brochure. All software titles only £3.00

**For Sale interface** for VIC 20 uses any standard computer compatible cassette recorder £10.00. Contact Matthew Metcalf, 2 Coalbank Road, Hetton le Hole. Telephone 265416.

**VIC-20 plus cassette** recorder switchable 4-slot motherboard 16K RAM 3K super expander, manuals, magazines and games. Very good condition. £150 ring Jane on Cambridge 207767.

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**VIC-20 software, maze** gold (new) £4.50, Arcadia £2.00, Duck-shoot, Sub Hunt £1.00, Cassette 50, £5.00. Tel: (0504) 267901, after 6pm, write S. O'Neil, 12A Blighs Lane, Derry, Northern Ireland.

**10 Disks unused**, BASF, 40 track, single density. £16.00. Commodore Macro Assembler, hardly used, £15.50. Ring Mark Asteris on Emsworth 5897, or write to 10A Park Crescent, Emsworth, Hants.

**VIC-20 voice synthesiser** 16K RAM Pack basic part 1 & 2 education programs, games + more, all for £50. Steven Ballard, Birchetts Lodge, Stockland Green, Speldhurst, Kent, or phone Langton 3173, now.

**CBM 64 software** for sale: Superbase 64 — £45, Easyscript — £25, RS232 Interface for Smith-Corona TP-I printer £15, Grandmaster £5, Zaxxon £4, Forbidden Forest £4. Others. All ½ price. Ring Albert (0865) 54084 (eves+w-end).

**CBM64 software to** swap. Titles include Up and Down, Ghostbusters, Bruce Lee, Pogo Joe, Popeye, Cyruss, Sentinel, Mikro Assembler and many more. Ring Slough (Berks) 32762 and ask for Raj.

**Perfect condition Vic-20** not yet a year old, recently serviced, still under guarantee, sold with cassette deck, intro to basics and 54 games for just £100. Phone (01) 368-3873 after four o'clock, Monday to Thursday.

**Penpals wanted VIC20** to exchange games programs ideas etc. Please write to Paul Hallas, 5 Beatrice Ave., Bebington, Merseyside L63 5JS.

**Pen Pal wanted to** swap games and tips for the CBM 64. Must be a boy, age between ten and thirteen. Write to A. Soord, 4 Westfield Close, Laverstock, Salisbury, Wilts., SP1 1SG. All letters answered)

**64 software to** swap. 100's titles, all types. Disk users please send list to Stephen Howard, 53 Valley View Road, Rochester, Kent or 'phone 0634 812833 for a fast reply.

**VIC-20 Penpal wanted**. 10 year old boy would like a penpal anywhere, but especially abroad. Write to Adrian Borg, 31 Knutsford Road, Moreton, Wirral, Merseyside L46 8TN.

**CBM64 VIC20 correspondents** required user group to user group also software exchange if possible.

**USA — C64 user** group would like to ex-software and ideas with European groups or individuals. Prefer disk, but will consider tape. Respond to: Metro-Area Commodore Club, Box M, Mendota, Minnesota, 55150 — U.S.A. Or call: (612) 778 8188.

**CBM-64 user in** Southern Africa wishes to swap software with users anywhere in the world. Have over 300 titles. To: Stanley Levitt, 3 Waverley Road, Savoy, Johannesburg, 2192, South Africa.

**Italian CBM 64 owner** wants to exchange programs on disk with owners in all the world. Please write to: Alberto Borgini, Via San Rocco 34, 21013 Gallarate (Varese), Italy.

**Unused easyscript disc** plus manual, £50 or exchange for Superbase 64. Thomas, 23 Wordsworth Avenue, Cheltenham GL51 7DY.

**VIC-20 starter pack.** Things included: VIC Book plus 14 games, value £250, will sell for £120 o.n.o. Ian Marshall, Kilbirnie 683816.

**VIC-20 for sale** — computer alone — all offers considered. Also Voo Doo Castle and Adventureland cartridges, £6 each. Many cassette games also for sale — unexpanded VIC only. Cheap prices. Phone 021 353 6383.

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**VIC20, (75) C2N.** Recorder + £25 cassettes for only £50. 3 cartridges, £15, switchable 16k. RAM, £30. Intro to Basic, £8 or the lot for £170.

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**CBM 64 software** for sale Cluedo Cassette) and Colossus Chess (disk), new at half price £6 each. Phone 0702 520624.

**Commodore 1526 (MPS802)** Dot Matrix. Printer bargain, £225. Commodore dual disk drive 3040. Slight fault. Offers to David, Tel: Hornchurch (040-24) 55733. Evenings and weekends.

**MPS801 Printer for** VIC or CBM 64 unused condition, £140. Ring 0203 490527, evenings.

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**C64 software for** sale. Manic Miner, Gridtrap, Beach Head, Hustler, Flight Path, £5 each or buy all together for £23. Phone (0348) 872216 and ask for Stuart.

**Arrow 64 and** Diary 64 cartridges watned also Stack Motherboard. Details to L. Garratt, 98 Victoria Road, Eccleshill, Bradford BD2 2DD.

**CBM games for** sale, £2.50. Cartridges, £4.00, Utility, £4.00, VIC 20 cassettes and Utility for £2.00. Send for free list (SAE). To S. Findlay, 297 Blackwell, Carlisle, Cumbria CA2 4RW or Tel: 33694.

**CBM 64 software to** sell American and British over 300 titles at reasonable rates. Popeye, Gyruss, Starwars. Phone 0462 59460 after 5pm or PO Box 27, Hitchin, Herts. Ask Ravinder.

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**Commodore 1520 printer** plotter. Boxed — as new. Only used once. Still under guarantee. £169.99 new. Bargain at £85. Gray, 35 Gordon Avenue, Prestatyn, Clwyd.

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**VIC20 starter pack,** 16K expansion programmers aid, Super expander, M/C Code Monitor, Stack Motherboards, 8 games cartridges, tape software and utilities, £50 of Books. £220 o.n.o. J. Adams 0274 682227.

**VIC 20 C2N** recorder 16K, switchable rampack, 20 games. All for £200. Tel: 0727 25597. Ask for Neil after 5pm.

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**Wanted CBM 64** and if possible C2N. Will pay about £120. Contact Simon Weaver, Wych Farm, Burton Road, Bridport, Dorset DT6 4PS. Telephone: Bridport 22427.

**VIC20 stack storeboard** with 16K expansion and Vickit 2. VIC20 games including Defender, Invader Fall, Missile Commander, Frogger, Cosmoids, Asteroids, Gridrunner and Laserzone. Also an introductory to Basic Part 1 with tapes. Also other books for the VIC20. Cost £140 new. New will offer £80 o.n.o. Tel. Scarborough (0723) 372275 for more details.

**CBM 64 software original** game programs. Must be cleared (s. hand) average cost £8.00. Send S.A.E. for list (1=£6, 2=£11, 5=£25) to:- S. Butcher, Clarefoot, Moffat, Dumfriesshire, Scotland.

**SX64 New, not** suitable for requirements. Will sacrifice for £490. Write: 7 Thorn Grove, Hale, Cheshire WA15 9AW or 'phone 061 941 3102.

**VIC20 starter pack** plus £100 worth software, 7 cartridges, cassettes etc. Intro to Programming 1 and 2, sell for £100 o.n.o. K. Cruickshank, 46 College View, Esh Winning, Durham, DH7 9AB. Tel: 734 888.

**All brand new** CBM64 computer, £150. Printer MPS802, £290. Disk drive 1541, £170 with software. Tel: 01-886 3268, evenings.

**If you are** a CBM64 user with disk drive you are invited to join Club64 the international user group. On joining every member may order free of charge 3 disks from our excellent software library. Annual membership ... £12 UK and Ireland, £15 Mainland Europe and £20 all other countries. Further details from Brendan Conroy Club64, 85 Uppr. Drumcondra Road, Dublin 9, Ireland.

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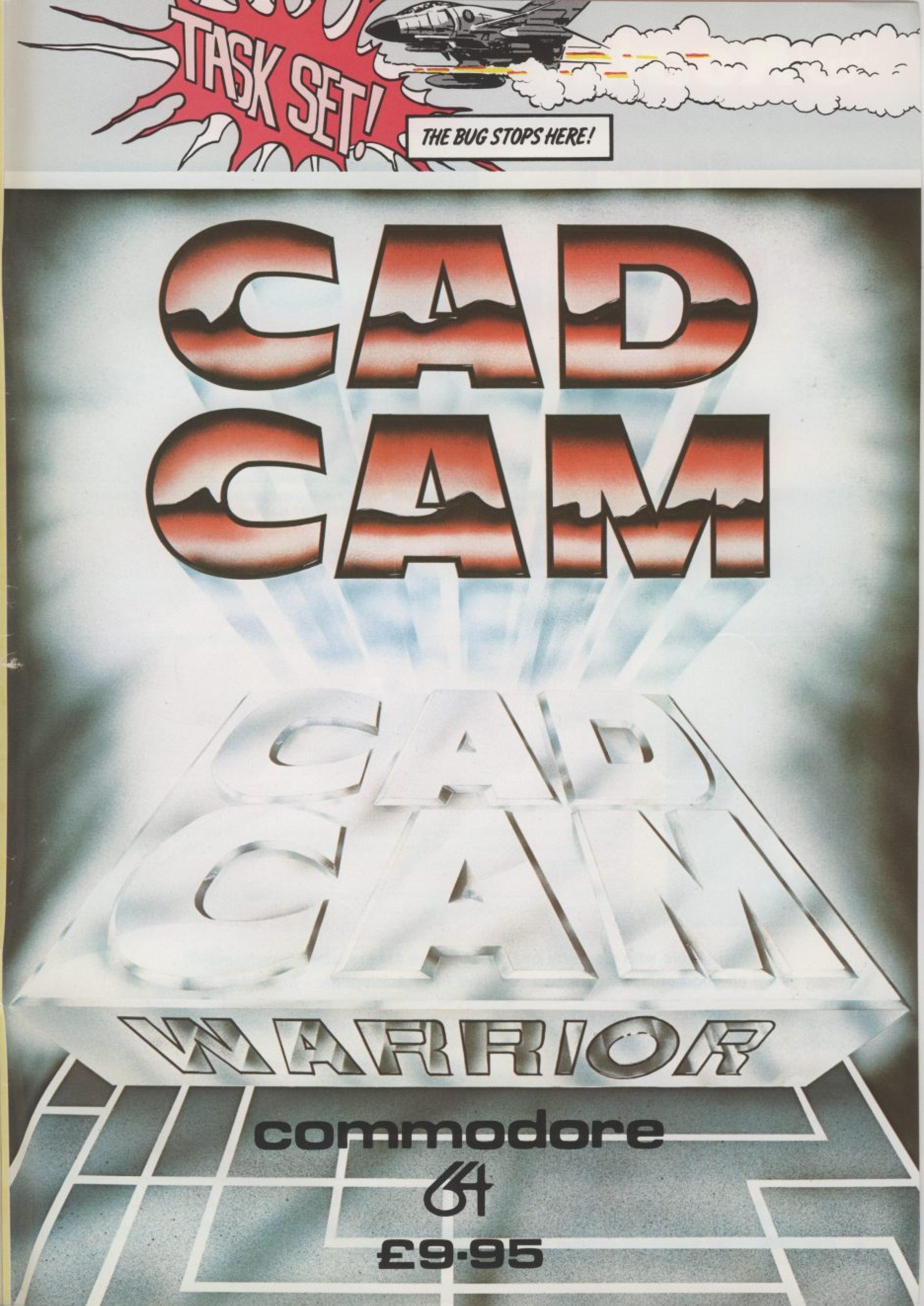
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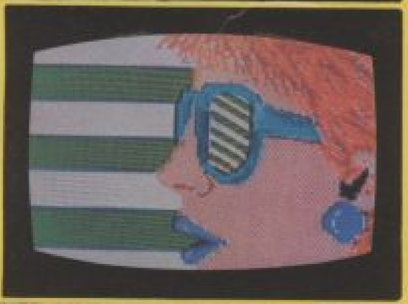
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